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**NORTH CAROLINA**  
**DEPARTMENT OF AGRICULTURE**  
**RALEIGH**

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**ANNUAL REPORT**  
OF  
**FARMERS' INSTITUTES**

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\*Assigned by the Bureau of Soils, United States Department of Agriculture.

†Assigned by the Bureau of Animal Industry, United States Department of Agriculture.

‡Assigned by the Bureau of Plant Industry, United States Department of Agriculture.

## LETTER OF TRANSMITTAL

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RALEIGH, N. C., December 13, 1913.

HON. W. A. GRAHAM,

*Commissioner of Agriculture,*

Raleigh, N. C.

SIR:—Herewith find my annual report of Farmers' and Women's Institutes for the current year, which I recommend for the January, 1914, BULLETIN.

Respectfully,

T. B. PARKER,

*Director of Farmers' Institutes.*

Approved for printing:

W. A. GRAHAM,

*Commissioner.*



# REPORT OF FARMERS' INSTITUTES, 1913

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BY T. B. PARKER, DIRECTOR OF FARMERS' INSTITUTES.

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During the year, December 1, 1912, to December 1, 1913, we held 260 institutes, each for men and women, with total attendance as follows:

At Regular Farmers' Institutes.....	34,978
At Regular Women's Institutes.....	23,007

In addition to the above we held a two-days Normal Institute for institute lectures, a three-day round-up institute and four institutes for negroes.

In many sections we had the hearty coöperation of ministers, school teachers, physicians, and business men, as well as the farmers. We are especially indebted to the newspapers for the many notices they have given of the institutes, and in some instances they have printed the programs in full. We very much appreciate their kindness in this respect.

No premiums were offered at the institutes for men, but premiums of a year's subscription to a woman's magazine were offered to the woman living on the farm, who made and exhibited the highest scoring loaf of bread, and to the woman living on the farm who prepared and exhibited the best school lunch under the conditions set forth in the following circular sent to applicants for information in regard to the exhibits:

## Explanations of Premiums Offered at Women's Institutes.

The following explanations in regard to the premiums that we are offering to the girls and women living on the farm for the best exhibits of bread and school lunches at our women's institutes may be of value to would-be exhibitors.

The school lunch exhibit is open to women over 18 years of age only; and the bread exhibit to girls and women. This ruling will be strictly adhered to. In either exhibit the exhibitor must sign a written statement, giving name, post-office address and age, that is, whether she is over or under 18, stating that she made the bread or prepared the lunch, place this information in an envelope, seal it and place with the exhibit. By this means the judge can be sure of getting the name and the address of the exhibitor.

The school lunch is deserving of more consideration than many parents give it. Childhood is an impressionable age and great care should be exercised as to influences that are brought to bear on the child during this critical period in its life. Influences that to us grown people seem small may leave an impression with children throughout their lives. For this reason we should be exceedingly careful as to the kind of influences that surround our children. Cleanliness, and neatness should be among the early impressions made upon the mind of the child. The school lunch is a good means of impressing the child with these habits, or perhaps I might say virtues, for they are virtues.

The school lunch should have three characteristics, appetizing, nourishing, and easily digested. A normal child of school age requires considerable food to meet the demands of up-keep and growth, so a school lunch should be sufficiently appetizing to induce him to eat freely. It should be composed of the things that will satisfy the hunger of a robust child, and at the same time be so easily digested as to permit the child to study in the afternoon rather than to be put to sleep from the effects of the lunch.

In preparing the school lunch avoid all soggy foods, all fried meats, unless a small quantity of well fried breakfast bacon may be permissible. Good bread and biscuits, boiled eggs, chicken and fresh meats, butter, sandwiches, ripe fruit, salted peanuts or other nuts, plain cakes and a bottle of fresh milk are sufficient to draw from and will supply the requirements of almost any school child. Sandwiches may be made from home grown vegetables with or without mayonnaise dressing as the child may prefer. The lunch should be put up in a neat basket or bucket and never in a pasteboard box. The latter is not as sanitary as the basket or bucket.

The basis of award will be as follows:

Neatness in packing.....	30%
Suitability of food to purpose.....	40%
Suitability of food to season.....	30%

In judging bread the following score card will be used: Flavor, 35 points; crust—color, depth, texture, 20 points; lightness, 15 points; grain and texture, 10 points; crumb—color and moisture, 10 points; shape and size, 10 points. Size recommended,  $7\frac{1}{2} \times 3\frac{1}{2} \times 2\frac{3}{4}$  inches.

No award will be given for bread scoring less than 75 points, nor for school lunches scoring less than 70 points.

#### FARMERS' INSTITUTES, 1913.

County	Date	Place	Lecturers
Alamance.....	July 24	Oakdale.....	Burgess, Eaton, Shaw.
	Aug. 21	Elon College.....	Parker, Cunningham, Shaw.
	Aug. 22	Maywood Academy.....	Parker, Cunningham, Shaw.
	Aug. 23	Friendship.....	Parker, Cunningham, Shaw.
	Aug. 25	Hawfields.....	Shaw, Cunningham.
Alexander.....	Aug. 23	Taylorsville.....	Hendricks, Gray, D. T., Nelson.
Alleghany.....	Sept. 25	Sparta.....	Gray, J. M., Shaw, Rives.
	Sept. 26	Glade Valley.....	Gray, J. M., Shaw, Parker, Rives.
Anson.....	July 24	Wadesboro.....	Sherman, Gray, D. T., McLean.
	July 25	Peachland.....	Sherman, Gray, D. T., McLean.
Ashe.....	Sept. 22	Jefferson.....	Gray, J. M., Shaw, Rives.
	Sept. 23	Grassy Creek.....	Gray, J. M., Shaw, Rives.
	Sept. 24	Scottville.....	Gray, J. M., Shaw, Rives.
Avery.....			
Beaufort.....	Dec. 10	Pantego.....	Parker, Sherman, Browne.
	Feb. 11	Bath.....	Garren, Hutt, Hill.
	Feb. 12	Aurora.....	Garren, Hutt, Hill.
	Feb. 13	Washington.....	Garren, Hill.
Bertie.....	Jan. 27	Aulander.....	Parker, Latham.
	Jan. 28	Mars Hill.....	Parker, Latham.
	Jan. 29	Windsor.....	Parker, Latham.
Bladen.....	Jan. 27	Dublin.....	Shaw.
	Feb. 3	Council.....	Shaw, Scott.
	Feb. 4	Abbottsburg.....	Shaw, Scott, McLean.
Brunswick.....	Jan. 28	Ash.....	Shaw.
	Jan. 29	Cool Run S. H.....	Shaw.
	Jan. 30	Supply.....	Shaw.
	Jan. 31	Bolivia.....	Shaw.
	Feb. 1	Winnabow.....	Shaw.

## FARMERS' INSTITUTES, 1913.

County	Date	Place	Lecturers
Buncombe.....	Aug. 12	Democrat.....	Hendricks, Robinson, Holmes.
	Aug. 18	Swannanoa.....	Parker, Gray, D. T., Meacham.
Burke.....	Aug. 6	Hildebrand.....	Sherman, Browne, French.
	Aug. 16	Hickory Grove.....	Hendricks, Robinson.
Cabarrus.....	July 30	Harrisburg.....	Garren, Eaton, Green.
	July 31	Mt. Pleasant.....	Garren, Eaton, Green.
	Aug. 1	Concord.....	Garren, Eaton, Green.
Caldwell.....	Sept. 16	Granite Falls.....	Shaw, Gray, Rives.
	Sept. 17	Oak Hill.....	Shaw, Gray, Rives.
	Sept. 18	Patterson S. H. ....	Shaw, Gray, Rives.
Camden.....	Jan. 17	Camden.....	Gray, Burgess.
Carteret.....	Jan. 31	Newport.....	Garren, Hill.
Caswell.....	July 21	Leasburg.....	Johnson, Cunningham, Fletcher.
	July 22	Yanceyville.....	Johnson, Cunningham, Fletcher.
Catawba.....	Aug. 2	Terrell.....	Sherman, Browne, French.
	Aug. 4	St. James S. H. ....	Sherman, Browne, French.
	Aug. 5	Conover.....	Sherman, Browne, French.
	Aug. 19	Wesley's Chapel Camp Ground.....	Hendricks, Gray, Nelson.
	Aug. 20	Cloninger's Farm.....	Hendricks, Gray, Nelson.
	Sept. 15	Claremont.....	Gray.
Chatham.....	July 18	Bynum.....	Sherman, Flowe, H. P., Green.
	July 19	Farrington.....	Sherman, Flowe, H. P., Green.
	July 21	Goldston.....	Rives, Eaton, Green.
	July 22	Siler City.....	Rives, Eaton, Green.
Cherokee.....	July 21	Murphy.....	Williams, Curtis, Holmes.
	July 25	Andrews.....	Williams, Curtis, Holmes.
Chowan.....	Dec. 20	Edenton.....	Sherman, Browne.
Clay.....	July 22	Ogden.....	Williams, Curtis, Holmes.
	July 23	Elf.....	Williams, Curtis, Holmes.
	July 24	Hayesville.....	Williams, Curtis, Holmes.
Cleveland.....	Mar. 24, 25	Mooresboro.....	Parker, Eaton.
	Aug. 14	Ellenboro.....	Sherman, French, Reed.
	Aug. 23	Casar.....	Sherman, Eaton, Robinson.
Columbus.....	Jan. 22	Hallsboro.....	Shaw, Scott.
	Jan. 24	Chadbourn.....	Shaw, Scott.
	Jan. 25	Tabor.....	Shaw, Scott.
	Jan. 27	Old Dock.....	Shaw, Scott.
Craven.....	Jan. 29	Beech Grove.....	Garren, Hill.
	Feb. 1	Vanceboro.....	Garren, Hill.
	Feb. 4	Dover.....	Garren, Hill.
Cumberland.....	Feb. 8	Fayetteville.....	Shaw, Scott, McLean.
	Feb. 10	Stedman.....	Shaw, Scott, McLean.
	Feb. 11	Wade.....	Shaw, Scott, McLean.
Currituck.....	Jan. 14	Currituck C. H. ....	Gray, Burgess.
	Jan. 15	Jarvisburg.....	Gray, Burgess.
Dare.....			
Davidson.....	July 24	Enterprise.....	Newman, Cunningham, Rives.
	July 25	Wallburg.....	Newman, Cunningham, Rives.
	July 26	Tyro.....	Newman, Cunningham, Rives.
	Aug. 18	Clarksburg.....	Garren, Roberts, Green.
	Aug. 19	Cedar Springs.....	Garren, Roberts, Green.
Davie.....	Aug. 3	Mocksville.....	Robinson.
	Aug. 8	Center Church.....	Gray, Robinson, Cunningham.
	Aug. 9	Fork Church.....	Gray, Robinson, Cunningham.
Duplin.....	Jan. 21	Concord S. H. ....	Garren, Hill.
	Jan. 22	Faison.....	Garren, Hill.
	May 2	Warsaw.....	Burgess.

## FARMERS' INSTITUTES, 1913.

County	Date	Place	Lecturers
Durham.....	July 18	Redwood.....	Johnson, Cunningham, Parker.
Edgecombe.....	Feb. 3	Speed.....	Gray, Latham.
	Feb. 5	Whitakers.....	Gray, Latham.
	Feb. 15	Macclesfield.....	Garren, Hutt.
	Feb. 22	Brick.....	Gray, Garren.
	Sept. 12	Test Farm.....	Graham, Gray, D. T., Garren.
Forsyth.....	Aug. 7	Rural Hall.....	Gray, Robinson, Cunningham.
	Aug. 11	Burke's Grove.....	Gray.
	Aug. 12	Clemmons.....	Gray.
	Aug. 16	Kernersville.....	Gray, Shaw, Cunningham.
Franklin.....	Feb. 15	Franklinton.....	Gray, Parker.
	Feb. 17	Louisburg.....	Gray.
	Mar. 1	Louisburg.....	Gray.
Gaston.....	Aug. 16	Sunnyside S. H. ....	Sherman, French.
	Aug. 18	Chapel Church.....	Sherman, Eaton, Robinson.
	Aug. 20	Stanley.....	Sherman, Eaton, Robinson.
Gates.....	Jan. 20	Gatesville.....	Gray, Eaton.
Graham.....			
Granville.....	Feb. 13	Oxford.....	Gray, Parker.
	Feb. 14	Hester.....	Parker, Gray.
		Test Farm.....	Fulton.
Greene.....	Jan. 25	Snow Hill.....	Garren, Hill.
Guilford.....	July 25	Pleasant Garden.....	Burgess, Eaton, Green.
	Aug. 18	Deep River.....	Hendricks, Nelson, Cunningham.
	Aug. 19	Battleground.....	Hendricks, Nelson, Cunningham.
	Aug. 20	McLeansville.....	Hendricks, Shaw, Cunningham.
	Sept. 1	Colfax.....	Parker, Gray.
Halifax.....	Jan. 25	Scotland Neck.....	Parker, Gray.
	Feb. 7	Weldon.....	Gray, Latham.
	Feb. 8	Littleton.....	Gray, Latham.
Harnett.....	Feb. 12	Dunn.....	Shaw, Scott, McLean.
Haywood.....	Aug. 9	Bethel.....	Hendricks, Millsaps, Holmes.
	Aug. 11	Rock Hill.....	Hendricks, Millsaps, Holmes.
Henderson.....	Aug. 5	Green River.....	Hendricks, Millsaps, Holmes.
	Aug. 7	Mills River.....	Hendricks, Millsaps, Holmes.
	Aug. 8	Liberty.....	Hendricks, Millsaps, Holmes.
Hertford.....	Jan. 21	Winton.....	Gray, Parker, Eaton.
	Jan. 22	Murfreesboro.....	Gray, Parker, Eaton.
	Jan. 30	Ahoskie.....	Gray, Parker.
Hoke.....	July 21	Raeford.....	McLean, Gray, Dan T.
Hyde.....	Dec. 12	Swan Quarter.....	Parker, Sherman, Browne.
	Dec. 13	Lake Landing.....	Parker, Sherman, Browne.
	Dec. 14	Fairfield.....	Parker, Sherman, Browne.
	Dec. 16	Sladesville.....	Parker, Sherman, Browne.
	Mar. 13, 14	Sladesville.....	Parker, Sherman.
Iredell.....	July 28	Mooresville.....	Garren, Eaton, Shuford.
	Aug. 16	Test Farm.....	Shuford, Nelson, Gray, D. T.
	Aug. 21	Cool Springs.....	Hendricks, Gray, D. T., Nelson.
	Aug. 22	Eupeptic Springs.....	Hendricks, Gray, D. T., Nelson.
Jackson.....	July 28	Quallatown.....	Williams, Millsaps, Holmes.
	July 29	Cullowhee.....	Williams, Millsaps, Holmes.
Johnston.....	Jan. 13	Woodward S. H. ....	Garren, Hill.
	Jan. 14	Selma.....	Garren, Hutt, Hill.
	Jan. 15	Benson.....	Scott, McLean.
	Mar. 28	Smithfield.....	Parker, Winston.
Jones.....	Jan. 27	Pollocksville.....	Garren, Hill.
	Feb. 6	Trenton.....	Garren, Hutt, Hill.

## FARMERS' INSTITUTES, 1913.

County	Date	Place	Lecturers
Lee.....	Aug. 2	Broadway.....	Gray.
	Aug. 6	Sanford.....	Garren, McLean, Rives.
Lenoir.....	Jan. 24	La Grange.....	Garren, Hill.
	Feb. 3	Kinston.....	Garren, Hill.
Lincoln.....	Aug. 21	Iron Station.....	Sherman, Robinson, Eaton.
	Aug. 22	Reepsville.....	Sherman, Robinson, Eaton.
	Aug. 25	Triangle.....	Sherman, Robinson, Eaton.
Macon.....	July 30	Higdonville.....	Williams, Millsaps, Holmes.
	July 31	Maxwell's S. H.....	Williams, Millsaps, Holmes.
	Aug. 1	Franklin.....	Williams, Millsaps, Holmes.
	Aug. 2	Otto.....	Williams, Millsaps, Holmes.
Madison.....	Aug. 13	Mars Hill.....	Hendricks, Millsaps, Holmes.
	Aug. 14	Marshall.....	Hendricks, Millsaps, Holmes.
Martin.....	Jan. 31	Robersonville.....	Gray, Latham.
	Feb. 1	Oak City.....	Gray, Latham.
McDowell.....	Aug. 12	Marion.....	Sherman, French, Browne.
	Aug. 15	Old Fort.....	Hendricks, Millsaps, Holmes.
Mecklenburg.....	Mar. 26	Charlotte.....	Parker, Eaton.
	July 31	Arlington.....	Sherman, Browne, French.
	Aug. 1	Rhyne.....	Sherman, Browne, French.
	Aug. 19	Dixie.....	Sherman, Robinson, Eaton.
	July 29	Huntersville.....	Garren, Eaton, Green.
	Sept. 5	Charlotte.....	Gray.
Mitchell.....	Aug. 7	Spruce Pine.....	Sherman, Browne, French.
	Aug. 11	Bakersville.....	Sherman, Browne, French.
Montgomery.....	Aug. 9	Star.....	Garren, McLean, Rives.
	Aug. 11	Mt. Gilead.....	Garren, Roberts, Rives.
Moore.....	July 18	Cameron.....	Rives, Gray, D. T., McLean.
	July 19	Aberdeen.....	Rives, Gray, D. T., McLean.
	Aug. 4	West End.....	Garren, McLean, Rives.
	Aug. 5	Carthage.....	Garren, McLean, Rives.
	Aug. 7	Glendon.....	Garren, McLean, Rives.
Nash.....	Aug. 8	Elise.....	Garren, McLean, Rives.
	Feb. 4	Nashville.....	Gray, Latham.
	Feb. 15	Stanhope.....	Garren, Hutt.
	Sept. 10	Stanhope.....	Graham, Garren, Gray, D. T.
	Jan. 20	Wrightsboro.....	Shaw, Scott.
New Hanover.....	Jan. 23	Lasker.....	Parker, Gray, Eaton.
	Jan. 24	Rich Square.....	Parker, Gray, Eaton.
Northampton.....	Feb. 5	Seaboard.....	Gray, Latham.
	Jan. 28	Harris S. H.....	Garren, Hill.
	Feb. 5	Richlands.....	Garren, Hill.
Orange.....	July 18	Efland.....	Parker, Hill, Winters.
Pamlico.....	Jan. 30	Bayboro.....	Garren, Hill.
Pasquotank.....	Jan. 16	Elizabeth City.....	Gray, Burgess.
	Jan. 18	Salem.....	Gray, Eaton.
Pender.....	Jan. 21	Burgaw.....	Shaw, Scott.
	Feb. 5	Atkinson.....	Shaw, Scott, McLean.
	Jan. 13	Hertford.....	Gray.
Perquimans.....	Jan. 19	Roxboro.....	Johnson, Cunningham, Fletcher.
Pitt.....	Dec. 9	Farmville.....	Parker, Sherman.
	Feb. 7	Grafton.....	Garren, Hutt, Hill.
	Feb. 8	Greenville.....	Garren, Hutt, Hill.
	Feb. 10	Grimesland.....	Garren, Hutt, Hill.
Polk.....	Aug. 4	Columbus.....	Hendricks, Millsaps, Holmes.
Randolph.....	July 23	Liberty.....	Burgess, Eaton, Green.
	Aug. 20	Farmer.....	Garren, Roberts, Rives.
	Aug. 21	Mt. Olivet Academy.....	Garren, Roberts, Rives.

## FARMERS' INSTITUTES, 1913.

County	Date	Place	Lecturers
Randolph	Aug. 22	Park's X Roads	Garren, Roberts, Rives.
	Aug. 23	Sophia	Garren, Roberts, Rives.
Richmond	July 22	Hoffman	Sherman, Gray, D. T., McLean.
	July 23	Rockingham	Sherman, Gray, D. T., McLean.
Robeson	Jan. 13	Lumber Bridge	Scott.
	Jan. 14	Red Springs	Scott.
	Jan. 16	Lumberton	Scott, Shaw, Millsaps.
	Jan. 18	St. Paul	Scott, Shaw, Millsaps.
	Jan. 23	Fairmont	Shaw, Scott.
Rockingham	July 23	Ruffin	Newman, Cunningham, Rives.
	Aug. 15	Gold Hill	Gray, Shaw, Cunningham.
Rowan	July 26	Mt. Ulla	Garren, Eaton, Green.
	Aug. 2	China Grove	Garren, Eaton, Green.
	Aug. 15	Liberty S. H.	Garren, Roberts, Rives.
	Aug. 16	Rockwell	Garren, Roberts, Rives.
	Aug. 25	Woodleaf	Hendricks, Roberts, Rives.
Rutherford	Aug. 13	Rutherfordton	Sherman, French, Reed.
	Aug. 14	Ellenboro	Sherman, French, Reed.
Sampson	Jan. 20	Clinton	Garren, Hill.
	Feb. 6	Garland	Shaw, McLean.
	Feb. 7	Salemberg	Shaw, Scott, McLean.
	Feb. 13	Newton Grove	Shaw, Scott, McLean.
	Feb. 14	Spring Branch	Shaw, Scott, McLean.
Scotland	Jan. 15	John's Station	Scott.
Stanly	Aug. 12	Big Lick	Garren, Roberts, Rives.
	Aug. 13	Endy, S. H.	Garren, Roberts, Rives.
	Aug. 14	Richfield	Garren, Roberts, Rives.
Stokes	Aug. 13	Walnut Cove	Gray, Shaw, Cunningham.
	Aug. 14	Danbury	Gray, Shaw, Cunningham.
Surry	Aug. 1	Copeland	Newman, Curtis, Cunningham.
	Aug. 4	Pilot Mountain	Newman, Robinson, Cunningham.
	Aug. 5	Westfield	Newman, Robinson, Cunningham.
	Aug. 6	Antioch Church	Gray, Robinson, Cunningham.
	Sept. 29	Piney Grove Church	Gray, Parker.
Swain	July 26	Bryson City	Williams, Curtis, Holmes.
Transylvania	Aug. 6	Selica	Williams, Millsaps, Holmes.
Tyrrell	Dec. 18	Columbia	Sherman, Browne.
Union	July 26	Wingate	Sherman, Gray, D. T., McLean.
	July 28	Waxhaw	Sherman, Browne, McLean.
	July 29	Prospect	Sherman, Browne, McLean.
	July 30	Indian Trail	Sherman, Browne, McLean.
Vance	Feb. 11	Middleburg	Parker, Gray.
	Feb. 12	Bear Pond	Parker, Gray.
	Sept. 9	Henderson	Gray.
Wake	Feb. 19	Zebulon	Garren, Hutt, Graham.
	Aug. 26, 27, 28	Raleigh	Round-up Institute.
Warren	Feb. 8	Littleton	Gray, Latham.
	Feb. 10	Warrenton	Gray, Parker.
Washington	Dec. 10	Plymouth	Parker, Sherman, Browne.
	Dec. 17	Mackey's Ferry	Parker, Sherman, Browne.
	Dec. 19	Creswell	Sherman, Browne.
Watauga	Sept. 18	Valle Crucis	Gray, Shaw, Rives.
	Sept. 19	Boone	Gray, Shaw, Rives.
Wayne	Jan. 15	Hood Swamp	Garren, Hill.
	Jan. 16	Salem Church	Garren, Hill.
	Jan. 17	Falling Creek	Garren, Hill.
	Jan. 18	Smith's Chapel	Garren, Hill.

## FARMERS' INSTITUTES, 1913.

County	Date	Place	Lecturers
Wayne.....	Jan. 23	Seven Springs.....	Garren, Hill.
	Sept. 13	Rose.....	Parker, Garren, Gray, D. T.
Wilkes.....	July 28	Beaver Creek.....	Newman, Curtis, Cunningham.
	July 29	Wilkesboro.....	Newman, Curtis, Cunningham.
	July 30	Ronda.....	Newman, Curtis, Cunningham.
	Sept. 27	Trap Hill.....	Gray, Parker, Shaw, Rives.
Wilson.....	Feb. 15	Stantonsburg.....	Garren, Hutt.
	Feb. 17	Lucama.....	Garren, Hutt.
Yadkin.....	July 31	Yadkinville.....	Newman, Curtis, Cunningham.
	Aug. 1	Booneville.....	Newman, Curtis, Cunningham.
Yancey.....	Aug. 8	Burnsville.....	Sherman, Browne, French.
	Aug. 9	Bald Creek.....	Sherman, Browne, French.

## LECTURERS AND SUBJECTS.

Name	No. Institutes Attended	Subjects
BROWNE, T. E..... District Demonstration Agent.	24	Peanut Culture. Corn Culture.
BURGESS, J. L..... Agronomist, Department of Agriculture.	9	Farm Crops. Soil Building.
CUNNINGHAM, J. S.....	32	Tobacco Culture.
CURTIS, R. S..... Assistant Animal Husbandry.	12	Beef Production.
EATON, W. H..... Dairy Expert.	25	Silo and Silage. Care and Feeding of Dairy Cows. Butter Making.
FLOWE, H. P..... Assistant Veterinarian.	4	Diseases of Live Stock.
FRENCH, A. L..... Farmer.	12	Soil Improvement With Live Stock.
FLETCHER, J. D..... Farmer.	4	Corn Culture.
FULTON, DR. R. H..... Plant Pathologist, Agricultural and Mechanical College.	1	Plant Diseases.
GARREN, G. M..... Assistant Agronomist, Department of Agriculture.	55	Soil Improvement. Corn Culture.
GRAY, JAS. M..... Assistant Director of Farmers' Institutes, Department of Agriculture.	57	Legumes as Soil Improvers. Soil Management. Corn Culture. Seed Selection.
GRAY, DAN T..... Chief of Animal Husbandry, Department of Agriculture.	18	Hog Growing.
GREEN, E. L.....	15	Chicken Growing.
HENDRICKS, M. J..... Farmer.	15	Wheat Culture. Corn Culture.
HILL, R. G..... Assistant Horticulturist.	27	Apple Culture. Vegetable Gardens.
HOLMES, J..... State Forester.	21	Forest Protection.

## LECTURERS AND SUBJECTS.

Name	No. Institutes Attended	Subjects
HUTT, W. N..... State Horticulturist, Department of Agriculture.	12	Pecan Growing. Orchard Management.
JOHNSON, J. M..... Expert in Farm Management, U. S. Department of Agriculture.	5	Farm Management.
LATHAM, J..... Farmer.	12	Crop Rotation.
MCLEAN, T. D..... District Demonstration Agent.	19	Cotton Growing. Soil Improvement.
MEACHAM, F. T..... Superintendent Test Farm.	3	
MILLSAPS, E. S..... District Demonstration Agent.	15	Corn Culture. Cotton Culture.
NELSON, O. A..... Farmer.	8	Cooperation.
NEWMAN, C. L..... Professor of Agriculture, Agricultural and Mechanical College.	12	Soil Improvement. Cotton Culture. Commercial Fertilizers.
PARKER, T. B..... Director of Farmers' Institutes, Department of Agriculture.	36	Commercial Fertilizers. Corn and Cotton Culture. Soil Building.
SHAW, S. B..... Assistant Horticulturist, Department of Agriculture.	42	Apple Culture. Spraying and Spray Materials.
SHERMAN, FRANKLIN, JR..... State Entomologist, Department of Agriculture.	40	Insect Pests and their Control.
SCOTT, R. W..... Farmer.	22	Live Stock on the Farm. Farm Management.
SHUFORD, W. J.....	4	Cooperation.
RIVES, J. R..... Farmer.	31	Cooperation.
REED, A. J..... Dairy Specialist, U. S. Department of Agriculture.	7	Dairying.
ROBERTS, DR. G. A..... College Veterinarian, Agricultural and Mechanical College.	15	Diseases of Live Stock.
ROBINSON, JOHN..... Farmer.	15	Dairying. Cooperation.
WILLIAMS, C. B..... Assistant Director Experiment Station, Department Agriculture.	15	Farm Crops. Lime and its Use.
WINSTON, R..... Assistant Pathologist, Agricultural and Mechanical College.	1	Plant Diseases.
WINTERS.....	2	Cotton Growing.

## County and Local Farmers' Institute Organizations.

Farmers' Institute Committees are appointed in all the counties where institutes are held. The duties of the members of the committees are to suggest places where the institutes are to be held, topics for discussion, advertise the meetings, look after the comfort of those attending the meetings, see that the house or hall in which the institute is to be held is put in good order before the hour for the institute to meet.

Farmers' clubs, local Farmers' Alliances, and local Farmers' Unions can greatly help the institutes by coöperating with the local institute committees and the conductor of the institute party. Such coöperation is welcomed.

## CHAIRMEN OF COUNTY AND LOCAL FARMERS' INSTITUTE COMMITTEES.

County	Chairman of Committee	Postoffice
Alamance.....	Chas. R. Cates.....	Mebane.
Elon College.....	W. P. Lawrence.....	Elon College.
Oakdale.....	W. A. Lineberry.....	Liberty.
Alexander.....	J. H. Smith.....	Taylorsville.
Alleghany.....	S. F. Thompson.....	Walls.
Anson.....	Dr. W. J. McLendon.....	Wadesboro.
Peachland.....	H. M. Baucom.....	Peachland.
Ashe.....	John Dent.....	Jefferson.
Scottsville.....	Ed. Shepherd.....	Scottsville.
Beaufort.....	W. D. Grimes.....	Washington.
Bath.....	J. B. Archbell.....	Bath.
Bertie.....	C. W. Spruill.....	Quitsna.
Mars Hill.....	Josiah Brown.....	Coleraine.
Bladen.....	R. B. Cromartie.....	Elizabethtown.
Council.....	T. A. Jones.....	Zara.
Tarheel.....	S. P. Metcalf.....	Tarheel.
Clarkton.....	E. J. Cox.....	Clarkton.
Abbotsburg.....	F. S. Averitt.....	Abbotsburg.
Brunswick.....	Jack Johnson.....	Winnabow.
Ash.....	R. M. Long.....	Ash.
Shallotte.....	E. M. Parker.....	Shallotte.
Supply.....	W. Sellers.....	Supply.
Cool Run S. H. ....	J. M. Hewett.....	Shallotte.
Buncombe.....	R. P. Hayes.....	Asheville.
Democrat.....	S. H. Carter.....	Democrat.
Swannanoa.....	R. W. Collett.....	Swannanoa.
Burke.....	J. M. Coulter.....	Connelly Springs.
Glen Alpine.....	John Houck.....	Glen Alpine.
Hickory Grove.....	J. A. Lackey.....	Morganton, No. 5.
Cabarrus.....	A. H. Litaker.....	Concord.
Harrisburg.....	C. L. Sims.....	Harrisburg.
Mt. Pleasant.....	W. H. Fisher.....	Mt. Pleasant.
Caldwell.....	G. M. Goforth.....	Lenoir.
Oak Hill.....	D. C. Flowers.....	Lenoir, No. 2.
Camden.....	W. G. Ferebee.....	Gregory.
Carteret.....	D. N. McCain.....	Newport.
Caswell.....	J. F. Walters.....	Blanche.
Leasburg.....	E. W. Lea.....	Leasburg.
Catawba.....	John Robinson.....	Hickory.
Claremont.....	J. A. Arndt.....	Claremont.
Wesley's Chapel.....	R. O. Ramseur.....	Hickory, No. 1.
Cloninger's Farm.....	C. F. Bowman.....	Hickory, No. 2.
Newton.....	C. E. Smyre.....	Newton.
Conover.....	Adrian Shuford.....	Conover.

## CHAIRMEN OF COUNTY AND LOCAL FARMERS' INSTITUTE COMMITTEES.

County	Chairman of Committee	Postoffice
Chatham.....	J. E. Womble.....	Apex, No. 4.
Bynum.....	R. L. Ward.....	Riggsbee.
Goldston.....	I. P. Coggins.....	Bear Creek.
Siler City.....	Geo. Womble.....	Siler City.
Cherokee.....	G. B. Walker.....	Andrews.
Murphy.....	B. M. Ledford.....	Ranger.
Andrews.....	D. W. Whisenhunt.....	Andrews.
Chowan.....	Z. W. Evans.....	Tyner.
Clay.....	W. T. Bumgarner.....	Hayesville.
Brasstown.....	Carl Scroggs.....	Brasstown.
Ogden.....	G. S. McClure.....	Ogden.
Elf.....	W. A. Cassada.....	Hayesville, No. 1.
Cleveland.....	J. T. Gardner.....	Shelby.
Casar.....	A. A. Warlick.....	Casar.
Columbus.....	D. Boughner.....	Chadbourn.
Tabor.....	Minos Meares.....	Tabor.
Whiteville.....	Dr. W. Ross Davis.....	Whiteville.
Old Dock.....	C. W. Suggs.....	Old Dock.
Hallsboro.....	J. A. Wyche.....	Hallsboro.
Craven.....	W. H. Bray.....	New Bern.
Vanceboro.....	O. McLawhorne.....	Vanceboro.
Beech Grove.....	G. T. Richardson.....	New Bern.
Cumberland.....	W. H. Downing.....	Fayetteville.
Stedman.....	R. S. Autry.....	Stedman.
Currituck.....	J. J. Ferebee.....	Shawboro.
Davidson.....	P. J. Leonard.....	Lexington.
Clarksburg.....	T. R. Hundley.....	Lexington, No. 2.
Cedar Springs.....	J. R. Crouse.....	Cid.
Wallburg.....	A. W. Yokley.....	Winston-Salem, No. 5.
Tyro.....	C. F. Kounts.....	Linwood, No. 1.
Welcome.....	J. C. Ripple.....	Lexington, No. 4.
Thomasville.....	J. W. Lambeth.....	Thomasville.
Davie.....	S. A. Woodruff.....	Mocksville.
Center Church.....	E. B. Barneycastle.....	Mocksville, No. 5.
Fork Church.....	W. F. Merrill.....	Mocksville, No. 3.
Duplin.....	J. A. Shine.....	Faison.
Calypso.....	J. T. Albritton.....	Mt. Olive.
Rose Hill.....	Maury Ward.....	Rose Hill.
Faison.....	H. J. Faison.....	Faison.
Durham.....	E. J. Parrish.....	Durham.
Edgecombe.....	G. T. DeBerry.....	Tarboro.
Conetoe.....	N. B. Dawson.....	Conetoe.
Whitakers.....	M. J. Battle.....	Whitakers.
Forsyth.....	A. B. Atwood.....	Winston-Salem.
Rural Hall.....	J. E. Fowler.....	Rural Hall.
Burke Grove.....	P. E. Burke.....	Winston-Salem, No. 1.
Clemmons.....	T. W. Griffith.....	Clemmons.
Kernersville.....	N. H. Smith.....	Kernersville.
Franklin.....	T. B. Wilder.....	Louisburg.
Franklinton.....	J. C. Winston.....	Franklinton.
Gaston.....	E. D. Thompson.....	Stanley.
Sunnyside School.....	H. S. Sellers.....	Kings Mountain.
Chapel Church.....	E. A. Hurley.....	Gastonia.
Gates.....	W. J. Boone.....	Drum Hill.
Granville.....	E. G. Moss.....	Creedmoor.
Stovall.....	C. L. Lewis.....	Stovall.
Creedmoor.....	C. H. Cozart.....	Creedmoor.
Greene.....	W. R. Dixon.....	Snow Hill.
Grimsley's Church.....	J. T. Dixon.....	Farmville.

## CHAIRMEN OF COUNTY AND LOCAL FARMERS' INSTITUTE COMMITTEES.

County	Chairman of Committee	Postoffice
Guilford.....	J. G. Frazier.....	Guilford College.
Deep River.....	W. L. Kivett.....	High Point.
McLeansville.....	Junius Boon.....	McLeansville.
Pleasant Garden.....	C. E. Hockart.....	Pleasant Garden.
Colfax.....	W. L. Gibbons.....	Colfax.
Halifax.....	J. H. Sherrod.....	Enfield.
Scotland Neck.....	G. W. Bryan.....	Scotland Neck.
Littleton.....	Claud Sessoms.....	Littleton.
Harnett.....	C. McArtan.....	Littleton.
Coats.....	T. D. Stewart.....	Coats.
Duke.....	A. F. Fowler.....	Duke.
Haywood.....	Dr. G. D. Green.....	Waynesville.
Bethel.....	M. D. Kinsland.....	Waynesville, No. 3.
Rock Hill.....	Jurvis H. Allison.....	Dellwood.
Canton.....	E. G. P. Murry.....	Canton.
Henderson.....	J. P. Fletcher.....	Fletcher.
Green River S. H.....	J. W. Ward.....	Zirconia.
Mills River S. H.....	M. M. Britton.....	Horse Shoe.
Dana.....	Samuel Rau.....	Hendersonville, No. 1.
Liberty.....	R. A. McKillop.....	Hendersonville.
Hertford.....	W. P. Shaw.....	Winton.
Ahoskie.....	A. E. Garrett.....	Ahoskie.
Hoke.....	J. H. Campbell.....	Raeford.
Hyde.....	Chas. Brim.....	Swan Quarter.
Middletown.....	J. S. Mann.....	Middletown.
Iredell.....	J. W. Sherrill.....	Statesville, No. 6.
Cool Springs.....	W. F. Reece.....	Statesville, No. 7.
Eupeptic Springs.....	J. K. Patterson.....	Statesville, No. 2.
Mooresville.....	T. J. Williams.....	Mooresville.
Jackson.....	Prof. Frank H. Brown.....	Cullowhee.
Quallatown.....	J. E. Rogers.....	Whittier.
Johnston.....	W. M. Saunders.....	Smithfield.
Kenly.....	L. B. Boyette.....	Kenly.
Benson.....	J. F. Lee.....	Benson.
Jones.....	T. C. Whitaker.....	Trenton.
Pollocksville.....	A. H. White.....	Pollocksville.
Lee.....	J. R. Rives.....	Sanford.
Lenoir.....	G. F. Loftin.....	Kinston.
Seven Springs.....	G. G. Quinn.....	Seven Springs.
LaGrange.....	J. E. Jones.....	LaGrange.
Lincoln.....	H. S. Robinson.....	Lincolnton.
Triangle.....	J. H. Nixon.....	Stanley.
McDowell.....	E. S. Frisbie.....	Marion.
Old Fort.....	J. L. Burgin.....	Old Fort.
Macon.....	Arthur Siler.....	Franklin.
Maxwell S. H.....	C. B. Yeargan.....	Franklin, No. 1.
Otto.....	D. T. Cabe.....	Otto.
Higdonville.....	Parker Moore.....	Higdonville.
Madison.....	L. M. Bryan.....	Marshall.
Mars Hill.....	A. F. Sprinkle.....	Mars Hill.
Martin.....	P. R. Rives.....	Robersonville.
Oak City.....	N. M. Worsley.....	Oak City.
Mecklenburg.....	C. C. Moore.....	Charlotte.
Huntersville.....	A. B. McAuley.....	Huntersville.
Derita.....	B. J. Hunter.....	Derita.
Mitchell.....	Jos. Bowditch.....	Toecane.
Spruce Pine.....	N. S. Lawrence.....	Spruce Pine.

## CHAIRMEN OF COUNTY AND LOCAL FARMERS' INSTITUTE COMMITTEES.

County	Chairman of Committee	Postoffice
Montgomery.....	O. B. Deaton.....	Troy.
Star.....	G. N. Searboro.....	Star.
Mt. Gilead.....	R. A. Bruton.....	Mt. Gilead.
Moore.....	T. D. McLean.....	Carthage.
West End.....	W. P. Cochrane.....	West End.
Glendon.....	A. J. Jones.....	Glendon.
Hemp.....	J. C. Monroe.....	Eagle Springs.
Cameron.....	H. P. McPherson.....	Cameron.
Nash.....	S. F. Austin.....	Nashville.
Stanhope High S.....	S. H. Brantley.....	Spring Hope.
New Hanover.....	Wm. Gregerson.....	Castle Hayne.
Northampton.....	J. W. Jessup.....	Rich Square.
Rich Square.....	W. E. Spivey.....	Rich Square.
Lasker.....	C. S. Lasker.....	Lasker.
Onslow.....	Dr. J. L. Nicholson.....	Richlands.
Richlands.....	J. M. Franck.....	Richlands.
Orange.....	A. H. Rimmer.....	Hillsboro.
Pamlico.....	G. T. Farnell.....	Bayboro.
Pasquotank.....	R. N. Morgan.....	Elizabeth City.
Weeksville.....	H. M. Pritchard.....	Weeksville.
Pender.....	W. M. Hand.....	Burgaw.
Atkinson.....	Geo. J. Moore.....	Atkinson.
Perquimans.....	M. H. White.....	Hertford.
Person.....	C. B. Brooks.....	Roxboro.
Pitt.....	J. F. Evans.....	Greenville.
Grimesland.....	Alston Grimes.....	Grimesland.
Grafton.....	J. C. Gaskins.....	Grafton.
Polk.....	T. T. Ballinger.....	Tryon.
Randolph.....	John Beeson.....	Asheboro.
Liberty.....	J. M. Williams.....	Liberty.
Mt. Olivet Academy.....	W. M. Moffitt.....	Moffitt.
Parks Cross Roads.....	J. O. Forester.....	Ramseur.
Randleman.....	Will Lassiter.....	Randleman.
Richmond.....	W. C. Leak.....	Rockingham.
Ellerbe.....	E. L. Pegram.....	Ellerbe.
Robeson.....	J. A. McAllister.....	Lumberton.
Parkton.....	W. S. Cobb.....	Parkton.
St. Paul.....	G. M. D. Howard.....	St. Paul.
Lumber Bridge.....	Neil Shaw.....	Lumber Bridge.
Fairmont.....	N. T. Andrews.....	Fairmont.
Red Springs.....	J. D. McLean.....	Red Springs.
Rockingham.....	J. V. Price.....	Madison.
Gold Hill.....	J. P. Wilson.....	Madison.
Ruffin.....	B. L. Blackwell.....	Pelham.
Leaksville.....	J. J. Thomas.....	Leaksville.
Appler.....	R. L. Pearson.....	Reidsville, No. 1.
Rowan.....	T. D. Brown.....	Salisbury.
China Grove.....	M. A. Stirewalt.....	China Grove.
Liberty S. H.....	A. N. Trexler.....	Gold Hill, No. 1.
Rockwell.....	C. M. Fisher.....	Rockwell.
Mt. Ulla.....	J. K. Goodman.....	Mt. Ulla.
Rutherford.....	J. M. Jones.....	Rutherfordton.
Ellenboro.....	G. S. Harrill.....	Ellenboro.
Sampson.....	S. H. Hobbs.....	Clinton.
Newton Grove.....	J. W. Bryan.....	Newton Grove.
Roseboro.....	D. W. Culbreth.....	Roseboro.
Garland.....	J. D. Johnson.....	Garland.
Spring Branch.....	W. A. Jackson.....	Cooper.

## CHAIRMEN OF COUNTY AND LOCAL FARMERS' INSTITUTE COMMITTEES.

County	Chairman of Committee	Postoffice
Scotland.....	W. N. McKenzie.....	Gibson.
Stanly.....	G. T. Dunlap.....	Norwood.
Richfield.....	E. D. Coggins.....	New London.
Endy S. H.....	W. A. Harward.....	Bridgeport.
Stokes.....	I. G. Ross.....	Walnut Cove.
Walnut Cove.....	Chap. Bodenheimer.....	Germanton.
Surry.....	S. C. Franklin.....	Mt. Airy.
Piney Grove Church.....	J. L. Jackson.....	Mt. Airy.
Copeland.....	Jos. Osborne.....	Rockford.
Mt. Airy.....	W. J. Herring.....	Mt. Airy.
Pilot Mountain.....	D. J. Denney.....	Pinnacle.
Swain.....	R. L. Sandidge.....	Bryson City.
Transylvania.....	W. H. Grogan.....	Brevard.
Selica.....	C. C. Duckworth.....	Selica.
Tyrrell.....	W. W. Sawyer.....	Columbia.
Union:		
Indian Trail.....	J. W. Rollins.....	Indian Trail.
Prospect.....	S. A. Latham.....	Monroe, No. 4.
Waxhaw.....	E. G. Yarborough.....	Waxhaw.
Wingate.....	Dr. J. R. Jerome.....	Wingate.
Vance.....	J. B. Allen.....	Henderson, No. 4.
Middleburg.....	J. K. Plummer.....	Middleburg.
Wake.....	W. B. Upchurch.....	Apex.
Zebulon.....	W. H. Chamblee, Jr.....	Zebulon.
Warren.....	H. T. Macon.....	Warrenton.
Wise.....	P. R. Perkinson.....	Wise.
Washington.....	T. W. Blount.....	Roper.
Creswell.....	W. T. Hopkins.....	Creswell.
Watauga.....	J. C. Horton.....	Boone.
Wayne.....	H. D. Ham.....	Goldsboro.
Smith Chapel.....	W. B. Hood.....	Mt. Olive.
Pikeville.....	E. T. Crawford.....	Pikeville.
Hood Swamp.....	J. F. Smith.....	Aaron.
Falling Creek.....	T. I. Sutton.....	Goldsboro, No. 4.
Wilkes.....	A. G. Hendren.....	Straw.
Trap Hill.....	M. A. Bryan.....	Trap Hill.
Wilson.....	E. B. Dean.....	Wilson.
Yadkin.....	A. S. Speer.....	Booneville.
Yancey.....	E. F. Watson.....	Burnsville.

## STATE FARMERS' CONVENTION.

S. H. Hobbs.....	President.....	Clinton, N. C.
T. E. Browne.....	Secretary.....	West Raleigh, N. C.

## WOMEN'S INSTITUTES, 1913

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This is the first year we have ever held as many institutes in the State for women as we have for men. With each year interest and number in attendance increase. This is well. Someone has very truthfully said that "The home is the center of all life and that woman is the center of the home." This being true we can most effectively reach the people of the community through the women, therefore, it is well that we shall support with all diligence this feature of our institute work.

The first Women's Institutes held in the State were in 1906, when 21 institutes were held in 19 counties. Since then they have grown in numbers and attendance each year until this year we held 260 Women's Institutes in 97 counties and with a total attendance of 23,007.

The following is a partial list of the subjects discussed at the Women's Institutes:

- Health Hints.
- Care of the Sick.
- Care of Infants.
- What to do Until the Doctor Comes.
- Home Nursing.
- Home Sanitation.
- Bread Making.
- School Lunches.
- Best Methods of Cooking.
- The Fireless Cooker.
- Household Conveniences.
- Child Training.
- Invalid Cookery.
- Time-saving Appliances.
- Preventable Diseases.
- Insect Pests.
- The Home Garden.
- The Country Woman and Her Relations to the Home and Community.
- The Country Home.
- Country Women's Organizations, etc.

## WOMEN'S INSTITUTES, 1913.

County	Date	Location	Lecturers
Alamance.....	July 24	Oakdale.....	Miss Hudgins, Miss Carpenter.
	Aug. 21	Elon College.....	Mrs. Hollowell, Miss Ward.
	Aug. 22	Maywood Academy.....	Mrs. Hollowell, Miss Ward.
	Aug. 23	Friendship H. S.....	Mrs. Hollowell, Miss Ward.
	Aug. 25	Hawfields S. H.....	Mrs. Hollowell, Miss Ward.
Alexander.....	Aug. 23	Taylorsville.....	Mrs. Whitted, Miss Mahler.
Alleghany.....	Sept. 25	Sparta.....	Miss Webb, Mrs. Slagle.
	Sept. 26	Glade Valley S. H. ....	Miss Webb, Mrs. Slagle.
Anson.....	July 24	Wadesboro.....	Mrs. Hutt, Miss White
	July 25	Peachland.....	Mrs. Hutt, Miss White.
Ashe.....	Sept. 22	Jefferson.....	Miss Webb, Mrs. Slagle.
	Sept. 23	Grassy Creek.....	Miss Webb, Mrs. Slagle.
	Sept. 24	Scottsville.....	Miss Webb, Mrs. Slagle.
Avery.....			
Beaufort.....	Dec. 10	Pantego.....	Mrs. McKimmon, Mrs. Cunningham.
	Feb. 11	Bath.....	Mrs. Hutt, Miss Ward.
	Feb. 12	Aurora.....	Mrs. Hutt, Miss Ward.
	Feb. 13	Washington.....	Mrs. Hutt, Miss Ward.
Bertie.....	Jan. 27	Aulander.....	Mrs. Hollowell, Miss Mahler.
	Jan. 28	Mars Hill.....	Mrs. Hollowell, Miss Mahler.
	Jan. 29	Windsor.....	Mrs. Hollowell, Miss Mahler.
Bladen.....	Jan. 17	Dublin.....	Mrs. McKimmon, Mrs. Cunningham.
	Feb. 3	Council.....	Mrs. Cunningham.
	Feb. 4	Abbottsburg.....	Mrs. McKimmon, Mrs. Cunningham.
Brunswick.....	Jan. 28	Ash.....	Miss Ward, Mrs. Cunningham.
	Jan. 29	Cool Run S. H.....	Miss Ward, Mrs. Cunningham.
	Jan. 30	Supply.....	Miss Ward, Mrs. Cunningham.
	Jan. 31	Bolivia.....	Miss Ward, Mrs. Cunningham.
	Feb. 1	Winnabow.....	Miss Ward, Mrs. Cunningham.
Buncombe.....	Aug. 12	Democrat.....	Mrs. Whitted, Miss Mahler.
	Aug. 18	Swannanoa.....	Mrs. Whitted, Miss Mahler.
Burke.....	Aug. 6	Hildebrand.....	Mrs. Hutt, Miss Clement.
	Aug. 16	Hickory Grove S. H.....	Mrs. Whitted, Miss Mahler.
Cabarrus.....	July 30	Harrisburg.....	Miss Hudgins, Miss Carpenter.
	July 31	Mt. Pleasant.....	Miss Hudgins, Miss Carpenter.
	Aug. 1	Concord.....	Miss Hudgins, Miss Carpenter.
Caldwell.....	Sept. 15	Granite Falls.....	Miss Webb, Mrs. Slagle.
	Sept. 16	Oak Hill.....	Miss Webb, Mrs. Slagle.
	Sept. 17	Patterson School.....	Miss Webb, Mrs. Slagle.
Camden.....	Jan. 17	Camden C. H.....	Mrs. Whitted, Miss Mahler.
Carteret.....	Jan. 31	Newport.....	Mrs. Hutt.
Caswell.....	July 21	Leasburg.....	Mrs. Hollowell, Miss Phelps.
	July 22	Yanceyville.....	Mrs. Hollowell, Miss Phelps.
Catawba.....	Aug. 2	Terrell.....	Mrs. Hutt, Miss White.
	Aug. 4	St. James S. H.....	Mrs. Hutt, Miss White.
	Aug. 5	Conover.....	Mrs. Hutt, Miss White.
	Aug. 19	Wesley's Chapel Camp Ground.....	Mrs. Whitted, Miss Mahler.
	Aug. 20	Cloninger's Farm.....	Mrs. Whitted, Miss Mahler.
Chatham.....	Sept. 15	Claremont.....	Miss Webb, Mrs. Slagle.
	July 18	Bynum.....	Miss Hudgins, Miss Carpenter.
	July 19	Farrington.....	Miss Hudgins, Miss Carpenter.
	July 21	Goldston.....	Miss Hudgins, Miss Carpenter.
	July 22	Siler City.....	Miss Hudgins, Miss Carpenter.
Cherokee.....	July 21	Murphy.....	Miss Parker, Miss Mahler.
	July 25	Andrews.....	Miss Parker, Miss Mahler.
Chowan.....	Dec. 20	Edenton.....	Mrs. McKimmon, Mrs. Cunningham.

## WOMEN'S INSTITUTES, 1913.

County	Date	Location	Lecturers
Clay.....	July 22	Ogden.....	Miss Parker, Miss Mahler.
	July 23	Elf.....	Miss Parker, Miss Mahler.
	July 24	Hayesville.....	Miss Parker, Miss Mahler.
Cleveland.....	Aug. 15	Shelby.....	Mrs. Hutt, Miss Clement.
	Aug. 23	Casar.....	Mrs. Hutt, Miss Clement.
Columbus.....	Jan. 22	Hallsboro.....	Mrs. McKimmon, Mrs. Cunningham.
	Jan. 24	Chadbourn.....	Mrs. McKimmon, Mrs. Cunningham.
	Jan. 25	Tabor.....	Mrs. McKimmon, Mrs. Cunningham.
	Jan. 27	Old Dock.....	Mrs. Cunningham.
Craven.....	Jan. 29	Beech Grove S. H.....	Mrs. Hutt.
	Feb. 1	Vanceboro.....	Mrs. Hutt.
	Feb. 4	Dover.....	Mrs. Hutt, Miss Ward.
Cumberland.....	Feb. 3	Payetteville.....	Mrs. McKimmon, Mrs. Cunningham.
	Feb. 10	Stedman.....	Mrs. McKimmon, Mrs. Cunningham.
	Feb. 11	Wade.....	Mrs. McKimmon, Mrs. Cunningham.
Currituck.....	Jan. 14	Currituck C. H.....	Mrs. Whitted, Miss Mahler
	Jan. 15	Jarvisburg.....	Mrs. Whitted, Miss Mahler.
Dare.....			
Davidson.....	July 19	Kennedy S. H.....	Miss Parker, Miss Mahler.
	July 24	Enterprise.....	Mrs. Hollowell, Miss Phelps.
	July 25	Wallburg.....	Mrs. Hollowell, Miss Phelps.
	July 26	Tyro.....	Mrs. Hollowell, Miss Phelps.
	Aug. 18	Clarksburg.....	Miss Hudgins, Miss Capps.
	Aug. 19	Cedar Springs S. H.....	Miss Hudgins, Miss Capps.
Davie.....	Aug. 8	Center Church.....	Mrs. Hollowell, Miss Ward.
	Aug. 9	Fork Church.....	Mrs. Hollowell, Miss Ward.
Duplin.....	Jan. 21	Concord S. H.....	Mrs. Hutt, Mrs. Ward.
	Jan. 22	Faison.....	Mrs. Hutt, Miss Ward.
Durham.....	July 18	Redwood S. H.....	Mrs. Hollowell, Miss Phelps.
Edgecombe.....	Feb. 3	Speed.....	Mrs. Hollowell, Miss Mahler.
	Feb. 5	Whitakers.....	Mrs. Hollowell, Miss Mahler.
	Feb. 15	Macclesfield.....	Mrs. Hutt, Miss Ward.
	Feb. 22	Brick School.....	Mrs. Hollowell, Miss Mahler.
	Sept. 11	Test Farm.....	Mrs. McKimmon, Mrs. Henley.
	Sept. 12	Tarboro.....	Mrs. McKimmon.
Forsyth.....	Aug. 7	Rural Hall.....	Mrs. Hollowell, Miss Ward.
	Aug. 11	Burke's Grove.....	Mrs. Hollowell, Miss Ward.
	Aug. 12	Clemmons.....	Mrs. Hollowell, Miss Ward.
	Aug. 16	Kernersville.....	Mrs. Hollowell, Miss Ward.
	Feb. 15	Franklinton.....	Mrs. Hollowell, Miss Mahler.
Franklin.....	Feb. 17	Louisburg.....	Mrs. Hollowell, Miss Mahler.
		Mapleville.....	Mrs. McKimmon.
		Inglehart.....	Mrs. McKimmon.
Gaston.....	Aug. 16	Sunnyside S. H.....	Mrs. Hutt, Miss Clement.
	Aug. 18	Chapel Church.....	Mrs. Hutt, Miss Clement.
	Aug. 20	Stanley.....	Mrs. Hutt, Miss Clement.
Gates.....	Jan. 20	Gatesville.....	Mrs. Whitted, Miss Mahler.
Graham.....			
Granville.....	Feb. 13	Oxford.....	Mrs. Hollowell, Miss Mahler.
	Feb. 14	Hester.....	Mrs. Hollowell, Miss Mahler.
		Test Farm.....	Mrs. McKimmon.
Greene.....	Jan. 25	Snow Hill.....	Mrs. Hutt.
Guilford.....	July 25	Pleasant Garden.....	Miss Hudgins, Miss Carpenter.
	Aug. 18	Deep River.....	Mrs. Hollowell, Miss Ward.
	Aug. 19	Battleground.....	Mrs. Hollowell, Miss Ward.
	Aug. 20	McLeansburg.....	Mrs. Hollowell, Miss Ward.
	Sept. 1	Colfax.....	Miss Webb, Mrs. Slagle.

## WOMEN'S INSTITUTES, 1913.

County	Date	Location	Lecturers
Halifax.....	Jan. 25	Scotland Neck.....	Mrs. Whitted, Miss Mahler.
	Feb. 7	Weldon.....	Mrs. Hollowell, Miss Mahler.
	Feb. 8	Littleton.....	Mrs. Hollowell, Miss Mahler.
Harnett.....	Feb. 12	Dunn.....	Mrs. McKimmon, Mrs. Cunningham.
Haywood.....	Aug. 9	Bethel.....	Miss Mahler, Mrs. Whitted.
	Aug. 11	Rock Hill.....	Miss Mahler, Mrs. Whitted.
Henderson.....	Aug. 5	Green River.....	Miss Mahler, Mrs. Whitted.
	Aug. 7	Mills River.....	Miss Mahler, Mrs. Whitted.
	Aug. 8	Liberty S. H.....	Miss Mahler, Mrs. Whitted.
Hertford.....	Jan. 21	Winton.....	Miss Mahler, Mrs. Whitted.
	Jan. 22	Murfreesboro.....	Miss Mahler, Mrs. Whitted.
	Jan. 30	Ahoskie.....	Mrs. Hollowell, Miss Mahler.
Hoke.....	July 21	Raeford.....	Mrs. Hutt, Miss White.
Hyde.....	Dec. 12	Swan Quarter.....	Mrs. McKimmon, Mrs. Cunningham.
	Dec. 13	Lake Landing.....	Mrs. McKimmon, Mrs. Cunningham.
	Dec. 14	Fairfield.....	Mrs. McKimmon, Mrs. Cunningham.
	Dec. 16	Sladesville.....	Mrs. McKimmon, Mrs. Cunningham.
	Mar.		
Iredell.....	13-14	Sladesville.....	Mrs. McKimmon, Miss Mahler.
	July 28	Mooreville.....	Miss Hudgins, Miss Crapenter.
	Aug. 16	Iredell Test Farm.....	Mrs. McKimmon, Mrs. Orr.
	Aug. 21	Cool Springs.....	Miss Mahler, Mrs. Whitted.
	Aug. 22	Eupeptic Springs.....	Miss Mahler, Mrs. Whitted.
Jackson.....	July 28	Quallatown.....	Miss Parker, Miss Mahler.
	July 29	Cullowhee.....	Miss Parker, Miss Mahler.
Johnston.....	Jan. 13	Woodward S. H.....	Mrs. Hutt, Miss Ward.
	Jan. 14	Selma.....	Mrs. Hutt, Miss Ward.
	Jan. 15	Benson.....	Mrs. Hutt, Miss Ward.
	Mar. 28	Smithfield.....	Mrs. McKimmon, Miss Mahler.
Jones.....	Jan. 27	Pollockville.....	Mrs. Hutt.
	Feb. 6	Trenton.....	Mrs. Hutt, Miss Ward.
Lee.....	Aug. 6	Sanford.....	Miss Hudgins, Miss Capps.
Lenoir.....	Jan. 24	La Grange.....	Mrs. Hutt, Miss Ward.
	Feb. 3	Kinston.....	Mrs. Hutt, Miss Ward.
Lincoln.....	Aug. 21	Iron Station.....	Mrs. Hutt, Miss Clement.
	Aug. 22	Reepsville.....	Mrs. Hutt, Miss Clement.
	Aug. 25	Triangle.....	Mrs. Hutt, Miss Clement.
Macon.....	July 30	Higdonville.....	Miss Parker, Miss Mahler.
	July 31	Maxwell's S. H.....	Miss Parker, Miss Mahler.
	Aug. 1	Franklin.....	Miss Parker, Miss Mahler.
Madison.....	Aug. 2	Otto.....	Miss Parker, Miss Mahler.
	Aug. 13	Mars Hill.....	Miss Mahler, Mrs. Whitted.
	Aug. 14	Marshall.....	Miss Mahler, Mrs. Whitted.
Martin.....	Jan. 31	Robersonville.....	Mrs. Hollowell, Miss Mahler.
	Feb. 1	Oak City.....	Mrs. Hollowell, Miss Mahler.
McDowell.....	Aug. 12	Marion.....	Mrs. Hutt, Miss Clement.
	Aug. 15	Old Fort.....	Miss Mahler, Mrs. Whitted.
Mecklenburg.....	July 29	Huntersville.....	Miss Hudgins, Miss Carpenter.
	July 31	Arlington.....	Mrs. Hutt, Miss White.
	Aug. 1	Rhyne.....	Mrs. Hutt, Miss White.
	Aug. 19	Dixie.....	Mrs. Hutt, Miss Clement.
Mitchell.....	Sept. 5	Charlotte.....	Mrs. Orr.
	Aug. 7	Spruce Pine.....	Mrs. Hutt, Miss Clement.
	Aug. 11	Bakersville.....	Mrs. Hutt, Miss Clement.
Montgomery.....	Aug. 9	Star.....	Miss Hudgins, Miss Capps.
	Aug. 11	Mt. Gilead.....	Miss Hudgins, Miss Capps.
Moore.....	July 18	Cameron.....	Mrs. Whitted, Miss White.
	July 19	Aberdeen.....	Mrs. Whitted, Miss White.

## WOMEN'S INSTITUTES, 1913.

County	Date	Location	Lecturers
Moore.....	Aug. 4	West End.....	Miss Hudgins, Miss Carpenter.
	Aug. 5	Carthage.....	Miss Hudgins, Miss Carpenter.
	Aug. 7	Glendon.....	Miss Hudgins, Miss Capps.
	Aug. 8	Elise.....	Miss Hudgins, Miss Capps.
Nash.....	Feb. 4	Nashville.....	Mrs. Hollowell, Miss Mahler.
	Feb. 18	Stanhope S. H.....	Mrs. Hutt, Miss Ward.
	Sept. 11	Stanhope S. H.....	Mrs. McKimmon, Mrs. Henley.
New Hanover.....	Jan. 20	Wrightsboro.....	Mrs. McKimmon, Mrs. Cunningham.
Northampton.....	Jan. 23	Lasker.....	Mrs. Hollowell, Miss Mahler.
	Jan. 24	Rich Square.....	Mrs. Whitted, Miss Mahler.
	Feb. 6	Seaboard.....	Mrs. Hollowell, Miss Mahler.
Onslow.....	Jan. 28	Harris S. H.....	Mrs. Hutt.
	Feb. 5	Richlands.....	Mrs. Hutt, Miss Ward.
Orange.....	July 18	Efland.....	Miss Parker, Miss Mahler.
Pamlico.....	Jan. 30	Bayboro.....	Mrs. Hutt.
Pasquotank.....	Jan. 16	Elizabeth City.....	Mrs. Whitted, Miss Mahler.
	Jan. 18	Salem.....	Mrs. Whitted, Miss Mahler.
	Jan. 21	Burgaw.....	Mrs. McKimmon, Mrs. Cunningham.
Pender.....	Feb. 5	Atkinson.....	Mrs. McKimmon, Mrs. Cunningham.
Perquimans.....	Jan. 13	Hertford.....	Mrs. Whitted, Miss Mahler.
Person.....	July 19	Roxboro.....	Mrs. Hollowell, Miss Phelps.
Pitt.....	Dec. 9	Farmville.....	Mrs. McKimmon, Mrs. Cunningham.
	Feb. 7	Grifton.....	Mrs. Hutt, Miss Ward.
	Feb. 8	Greenville.....	Mrs. Hutt, Miss Ward.
	Feb. 10	Grimesland.....	Mrs. Hutt, Miss Ward.
Polk.....	Aug. 4	Columbus.....	Miss Mahler, Mrs. Whitted.
Randolph.....	July 23	Liberty.....	Miss Hudgins, Miss Carpenter.
	Aug. 20	Farmer.....	Miss Hudgins, Miss Capps.
	Aug. 21	Mt. Olivet Academy.....	Miss Hudgins, Miss Capps.
	Aug. 22	Park's X Roads.....	Miss Hudgins, Miss Capps.
	Aug. 23	Sophia.....	Miss Hudgins, Miss Capps.
	July 22	Hoffman.....	Mrs. Hutt, Miss White.
Richmond.....	July 23	Rockingham.....	Mrs. Hutt, Miss White.
	Jan. 13	Lumber Bridge.....	Mrs. McKimmon, Mrs. Cunningham.
Robeson.....	Jan. 14	Red Springs.....	Mrs. McKimmon, Mrs. Cunningham.
	Jan. 16	Lumberton.....	Mrs. McKimmon, Mrs. Cunningham.
	Jan. 18	St. Paul.....	Mrs. McKimmon, Mrs. Cunningham.
	Jan. 23	Fairmont.....	Mrs. McKimmon, Mrs. Cunningham.
	July 23	Ruffin.....	Mrs. Hollowell, Miss Phelps.
Rockingham.....	Aug. 15	Gold Hill.....	Mrs. Hollowell, Miss Ward.
	July 26	Mt. Ulla.....	Miss Hudgins, Miss Carpenter.
Rowan.....	Aug. 2	China Grove.....	Miss Hudgins, Miss Carpenter.
	Aug. 15	Liberty S. H.....	Miss Hudgins, Miss Capps.
	Aug. 16	Rockwell.....	Miss Hudgins, Miss Capps.
	Aug. 25	Woodleaf.....	Miss Mahler, Mrs. Whitted.
	Aug. 13	Rutherfordton.....	Mrs. Hutt, Miss Clement.
Rutherford.....	Aug. 14	Ellenboro.....	Mrs. Hutt, Miss Clement.
	Aug. 20	Clinton.....	Mrs. Hutt, Miss Ward.
Sampson.....	Jan. 20	Garland.....	Mrs. McKimmon, Mrs. Cunningham.
	Feb. 6	Salemberg.....	Mrs. McKimmon, Mrs. Cunningham.
	Feb. 7	Newton Grove.....	Mrs. McKimmon, Mrs. Cunningham.
	Feb. 13	Spring Branch.....	Mrs. McKimmon, Mrs. Cunningham.
	Jan. 15	John's Station.....	Mrs. McKimmon, Mrs. Cunningham.
Scotland.....	Aug. 12	Big Lick.....	Miss Hudgins, Miss Capps.
Stanly.....	Aug. 13	Endy S. H.....	Miss Hudgins, Miss Capps.
	Aug. 14	Richfield.....	Miss Hudgins, Miss Capps.
	Aug. 13	Walnut Cove.....	Mrs. Hollowell, Miss Ward.
Stokes.....	Aug. 14	Danbury.....	Mrs. Hollowell, Miss Ward.

## WOMEN'S INSTITUTES, 1913.

County	Date	Location	Lecturers
Surry.....	Aug. 2	Copeland.....	Mrs. Hollowell, Miss Phelps.
	Aug. 4	Pilot Mountain.....	Mrs. Hollowell, Miss Phelps.
	Aug. 5	Westfield.....	Mrs. Hollowell, Miss Phelps.
	Aug. 6	Antioch Church.....	Mrs. Hollowell, Miss Ward.
	Sept. 29	Piney Grove.....	Miss Webb, Mrs. Slagle.
Swain.....	July 26	Bryson City.....	Miss Parker, Miss Mahler.
Transylvania.....	Aug. 6	Selica.....	Miss Mahler, Mrs. Whitted.
Tyrrell.....	Dec. 18	Columbia.....	Mrs. McKimmon, Mrs. Cunningham.
Union.....	July 26	Wingate.....	Mrs. Hutt, Miss White.
	July 28	Waxhaw.....	Mrs. Hutt, Miss White.
	July 29	Prospect.....	Mrs. Hutt, Miss White.
	July 30	Indian Trail.....	Mrs. Hutt, Miss White.
Vance.....	Feb. 11	Middleburg.....	Mrs. Hollowell, Miss Mahler.
	Feb. 12	Bear Pond.....	Mrs. Hollowell, Miss Mahler.
	Sept. 9	Henderson.....	Miss Ward.
Wake.....	Feb. 19	Zebulon.....	Mrs. Hutt, Miss Ward.
Warren.....	Feb. 10	Warrenton.....	Mrs. Hollowell, Miss Mahler.
Washington.....	Dec. 10	Plymouth.....	Mrs. McKimmon, Mrs. Cunningham.
	Dec. 17	Mackey's Ferry.....	Mrs. McKimmon, Mrs. Cunningham.
	Dec. 19	Creswell.....	Mrs. McKimmon, Mrs. Cunningham.
Watauga.....	Sept. 19	Valle Crucis.....	Miss Webb, Mrs. Slagle.
	Sept. 20	Boone.....	Miss Webb, Mrs. Slagle.
Wayne.....	Jan. 15	Hood Swamp.....	Mrs. Hutt, Miss Ward.
	Jan. 16	Salem Church.....	Mrs. Hutt, Miss Ward.
	Jan. 17	Falling Creek.....	Mrs. Hutt, Miss Ward.
	Jan. 18	Smith's Chapel.....	Mrs. Hutt, Miss Ward.
	Jan. 23	Seven Springs.....	Mrs. Hutt, Miss Ward.
Wilkes.....	July 28	Beaver Creek.....	Mrs. Hollowell, Miss Phelps.
	July 29	Wilkesboro.....	Mrs. Hollowell, Miss Phelps.
	July 30	Ronda.....	Mrs. Hollowell, Miss Phelps.
	Sept. 27	Trap Hill.....	Miss Webb, Mrs. Slagle.
Wilson.....	Feb. 15	Stantonsburg.....	Mrs. Hutt, Miss Ward.
	Feb. 17	Lucama.....	Mrs. Hutt, Miss Ward.
	July 31	Yadkinville.....	Mrs. Hollowell, Miss Phelps.
Yadkin.....	Aug. 1	Booneville.....	Mrs. Hollowell, Miss Phelps.
	Aug. 8	Burnsville.....	Mrs. Hutt, Miss Clement.
Yancey.....	Aug. 8	Burnsville.....	Mrs. Hutt, Miss Clement.
	Aug. 9	Bald Creek.....	Mrs. Hutt, Miss Clement.

## LECTURERS AND SUBJECTS.

Name	No. Institutes Attended	Subjects
CAPPS, MISS ELIZABETH.....	16	Bread Making. Lunches. Household Conveniences.
CARPENTER, MISS NORA.....	15	Bread Making. Pin Money on the Farm.
CLEMENT, MISS LINDA.....	17	School Lunches. Bread Making.
CUNNINGHAM, Mrs. J. S.....	40	Bread Making. Household Conveniences.

## LECTURERS AND SUBJECTS.

Name	No. Institutes Attended	Subjects
HENLEY, MRS. J. M. ....	3	Bread Making. Household Conveniences. The Home Garden.
HOLLOWELL, MRS. W. R. ....	55	Care of Infants. Value of Foods. Bread Making. The Country Woman and Her Relation to Home and Community.
HUDGINS, MISS CARRIE. ....	32	The Country Home. Child Training. Canning. Home Nursing.
HUTT, MRS. W. N. ....	64	Influence of Foods. Care of Infants. What to Do till the Doctor Comes.
MAHLER, MISS LOUISE. ....	66	Kitchen Conveniences. Biscuit Demonstration. Bread Making.
McKIMMON, MRS. JANE. ....	42	Breads and Bread Making. Health Talks.
PARKER, MISS KATHARINE. ....	15	Breads and Bread Making. Health Hints.
PHELPS, MISS CAROLINE B. ....	16	Household Conveniences. Care of the Sick.
SLAGLE, MRS. HENRY. ....	13	Home Conveniences. Country Women's Organizations.
WARD, MISS JANE E. ....	43	Home Care of the Sick. Bread Making.
WEBB, MISS LUCIE. ....	13	Fireless Cooker. Bread Making.
WHITE, MISS JESSIE. ....	17	Care of the Sick. Fireless Cooker. Bread Making.
WHITTED, MRS. J. M. ....	26	Poultry Raising. Care of Infants. Bread Making.

**County and Local Women's Organizations.**

The plan of organization of the Women's Institutes is the same as for men. An active, interested woman is selected for chairman and she is given the best committee that can be selected to assist her. The chairman and other members of the committee are expected to work up interest in Women's institutes and endeavor to get the coöperation of all the progressive farm women of the community in securing attendance at the institutes. They are also expected to have committee meetings during the year to discuss among themselves questions pertaining to their work. They should invite the women of the community to join them at these committee meetings and take part in the discussions.

## LIST OF CHAIRMEN OF WOMEN'S INSTITUTE COMMITTEES.

County	Chairman of Committee	Postoffice
Alamance:		
Oakdale.....	Mrs. J. A. Hornaday.....	Liberty.
Maywood.....	Miss Mary McCulloch.....	Burlington.
Hawfields.....	Mrs. R. W. Scott.....	Haw River.
Alexander.....	Mrs. W. J. Reece.....	Liledoun.
Alleghany.....	Mrs. T. J. Carson.....	Sparta.
Scottsville.....	Mrs. E. K. Plummer.....	Scottsville.
Anson.....	Mrs. J. G. Boylin.....	Wadesboro.
Peachland.....	Mrs. M. L. Horne.....	Peachland.
Ashe.....	Mrs. C. H. Smithdeal.....	Jefferson.
Grassy Creek.....	Mrs. Ed. Greer.....	Grassy Creek.
Bertie.....	Miss Clara Pigg.....	Coleraine.
Windsor.....	Mrs. W. E. Copeland.....	Windsor.
Bladen.....	Mrs. W. F. McNeill.....	Dublin.
Brunswick.....	Mrs. Q. K. Mintz.....	Mill Branch.
Cool Run.....	Mrs. T. Mintz.....	Shallotte.
Supply.....	Mrs. C. W. Kirby.....	Supply.
Winnabow.....	Mrs. Jack Johnson.....	Winnabow.
Buncombe:		
Democrat.....	Miss Bert Roberts.....	Democrat.
Swannanoa Test Farm.....	Mrs. R. W. Collett.....	Swannanoa.
Cabarrus.....	Mrs. D. B. Parrish.....	Concord.
Harrisburg.....	Mrs. W. D. Harris.....	Harrisburg.
Caldwell:		
Granite Falls.....	Mrs. J. M. Yount.....	Granite Falls.
Oak Hill.....	Miss Little Deal.....	Lenoir.
Camden.....	Mrs. H. C. Ferebee.....	Camden.
Caswell.....	Miss Margaret Page.....	Yanceyville.
Leasburg.....	Miss Mattie Pullian.....	Leasburg.
Carteret.....	Mrs. H. I. Pridgen.....	Newport.
Catawba:		
Terrell.....	Mrs. T. F. Connor.....	Terrell.
Conover.....	Mrs. J. A. Yount.....	Conover.
Claremont.....	Mrs. H. S. Arndt.....	Claremont.
Wesley's Chapel.....	Mrs. Gordon Wilfong.....	Newton.
Fairview S. H.....	Mrs. John Smith.....	Hickory.
Chatham.....	Miss Bonnie Cole.....	Riggsbee.
Farrington.....	Mrs. J. R. Matthews.....	New Hill.
Goldston.....	Miss Mollie Goldston.....	Goldston.
Siler City.....	Mrs. D. L. Webster.....	Siler City.
Cherokee.....	Mrs. Geo. Walker.....	Andrews.
Murphy.....	Mrs. J. T. Hayes.....	Tomotla.
Clay.....	Mrs. Claud Sanderson.....	Hayesville.
Ogden.....	Mrs. R. L. Johnston.....	Brasstown.
Elf.....	Miss Mary Ray.....	Hayesville.
Cleveland.....	Mrs. Elam.....	Cleveland Mills.
Columbus.....	Mrs. J. A. Formyduval.....	Old Dock.
Craven.....	Mrs. B. P. Whitford.....	Askin.
Cumberland.....	Mrs. M. Maxwell.....	Fayetteville.
Stedman.....	Mrs. Bessie Butler.....	Stedman.
Currituck.....	Mrs. H. E. Morrisette.....	Currituck.
Jarvisburg.....	Mrs. H. D. Newbern.....	Powells Point.
Davidson:		
Clarksbury.....	Mrs. Carrie Clodfelter.....	Lexington.
Cedar Springs.....	Mrs. J. R. Crouse.....	Cid.
Enterprise.....	Mrs. M. E. Mock.....	Enterprise.
Wallburg.....	Mrs. C. M. Wall.....	Wallburg.
Tyro.....	Mrs. Mary Wilson.....	Linwood.
Kennedy School House.....	Mrs. B. E. Paine.....	Thomasville.

## LIST OF CHAIRMEN OF WOMEN'S INSTITUTES.

County	Chairman of Committee	Postoffice
Davie:		
Center Church.....	Mrs. W. H. Griffin.....	Mocksville.
Fork Church.....	Mrs. Jos. Bringar.....	Mocksville.
Duplin.....	Mrs. I. L. Faison.....	Faison.
Durham.....	Mrs. Ike Suits.....	Durham.
Edgecombe.....	Mrs. B. F. Shelton.....	Speed.
Whitakers.....	Mrs. L. L. Draughon.....	Whitakers.
Forsyth:		
Clemmons.....	Mrs. T. W. Griffith.....	Clemmons.
Burke's Grove.....	Mrs. H. W. Johnson.....	Winston-Salem.
Franklin.....	Mrs. J. B. Fulghum.....	Louisburg.
Gaston:		
Sunnyside S. H. ....	Mrs. J. T. Oates.....	Bessemer City.
Chapel Church.....	Mrs. Peter Rhyne.....	Gastonia.
Gates.....	Mrs. R. W. Simpson.....	Trotville.
Guilford:		
Colfax.....	Mrs. Henry Cude.....	Colfax.
Pleasant Garden.....	Mrs. S. L. Foust.....	Pleasant Garden.
Halifax.....	Mrs. G. W. Bryan.....	Scotland Neck.
Littleton.....	Mrs. J. W. Rhodes.....	Littleton.
Haywood:		
Bethel.....	Mrs. J. E. Wilson.....	Canton.
Rock Hill.....	Mrs. Jas. Boyd.....	Waynesville.
Henderson:		
Green River S. H. ....	Mrs. P. J. Hart.....	Zirconia.
Mills River.....	Mrs. Tom Osborne.....	Horse Shoe.
Liberty S. H. ....	Miss Willie Brown.....	Hendersonville.
Hertford.....	Mrs. S. B. Taylor.....	Winton.
Murfreesboro.....	Mrs. J. D. Bruner.....	Murfreesboro.
Hoke.....	Mrs. T. B. Upchurch.....	Raeford.
Hyde.....	Mrs. S. D. Mann.....	Swan Quarter.
Fairfield.....	Mrs. J. C. Watson.....	Fairfield.
Iredell.....	Mrs. W. L. Cook.....	Mooreville.
Cool Springs.....	Miss Mabel Swann.....	Elmwood.
Eupeptic Springs.....	Mrs. R. L. Alexander.....	Harmony.
Jackson.....	Mrs. A. C. Reynolds.....	Culowhee.
Quallatown.....	Mrs. P. H. Ferguson.....	Whittier.
Johnston.....	Mrs. J. L. Boyette.....	Kenly.
Jones.....	Mrs. Geo. White.....	Pollocksville.
Trenton.....	Miss Bessie Whitaker.....	Trenton.
Lee.....	Miss Mamie Carter.....	Glendon.
Lenoir.....	Mrs. Mary D. Pitte.....	LaGrange.
Lincoln:		
Iron Station.....	Mrs. S. N. Brown.....	Iron Station.
Reepsville.....	Mrs. L. S. Kiser.....	Reepsville.
McDowell.....	Mrs. J. E. Jameson.....	Garden City.
Old Fort.....	Mrs. Chas. Burgin.....	Old Fort.
Macon:		
Higdonville.....	Mrs. S. E. Gray.....	Higdonville.
Maxwell's S. H. ....	Mrs. Henry Slagle.....	Franklin.
Otto.....	Mrs. D. P. Cabe.....	Otto.
Madison:		
Mars Hill.....	Mrs. R. L. Runion.....	Mars Hill.
Marshall.....	Miss Ollie Hendricks.....	Marshall.
Martin.....	Mrs. W. T. Taylor.....	Robersonville.
Oak City.....	Mrs. Justus Everett.....	Palmyra.

## LIST OF CHAIRMEN OF WOMEN'S INSTITUTES.

County	Chairman of Committee	Postoffice
Mecklenburg:		
Huntersville.....	Mrs. Hattie Bradford.....	Huntersville.
Paw Creek.....	Mrs. Felix Beatty.....	Paw Creek.
Dixie.....	Mrs. Ferrie Pegram.....	Charlotte.
Mitchell.....	Mrs. M. J. Bowditch.....	Toecane.
Montgomery:		
Star.....	Mrs. Jonah Leech.....	Star.
Mt. Gilead.....	Mrs. J. P. Haywood.....	Mt. Gilead.
Moore:		
West End.....	Miss Mary Von Canon.....	West End.
Carthage.....	Mrs. Spence Kelley.....	Carthage.
Hemp.....	Mrs. N. J. Carter.....	Hemp.
Cameron.....	Mrs. M. McL. McKeithan.....	Cameron.
Aberdeen.....	Mrs. Henry Page.....	Aberdeen.
Nash.....	Mrs. J. T. Strickland.....	Nashville.
Stanhope H. S.....	Mrs. W. A. Harper.....	Spring Hope.
New Hanover.....	Mrs. E. I. Herring.....	Wilmington.
Northampton.....	Mrs. J. W. Jessup.....	Rich Square.
Lasker.....	Mrs. T. G. Whims.....	Lasker.
Seaboard.....	Mrs. M. R. Stevenson.....	Seaboard.
Onslow.....	Mrs. C. B. Basden.....	Richlands.
Harris S. H.....	Mrs. H. B. Williams.....	Jacksonville.
Orange.....	Mrs. Carl Forest.....	Efland.
Pasquotank.....	Mrs. R. N. Morgan.....	Elizabeth City.
Salem.....	Mrs. S. J. Parsons.....	Weeksville.
Pender.....	Mrs. E. McW. Moore.....	Burgaw.
Person.....	Mrs. C. M. Winstead.....	Roxboro.
Pitt.....	Mrs. J. R. Quinerly.....	Griton.
Polk.....	Mrs. L. H. Cloud.....	Columbus.
Randolph:		
Liberty.....	Miss Ida Williams.....	Liberty.
Farmer.....	Mrs. Frances Hubbard.....	Farmer.
Mt. Olivet.....	Mrs. J. E. Sugg.....	Erect.
Parks Cross Roads.....	Mrs. J. A. Ellis.....	Ramseur.
Sophia.....	Mrs. L. B. Cole.....	Sophia.
Richmond.....	Mrs. Hattie Ellerbe.....	Rockingham.
Hoffman.....	Mrs. N. C. Scarboro.....	Hoffman.
Robeson.....	Mrs. D. Y. McGoogan.....	Lumber Bridge.
Hallsboro.....	Mrs. Lucy Brown.....	Hallsboro.
Fairmont.....	Mrs. D. W. Galloway.....	Fairmont.
Rockingham.....	Mrs. C. J. Wariner.....	Ruffin.
Rowan:		
Mt. Ulla.....	Miss Nannie Hart.....	Mooresville.
China Grove.....	Mrs. H. E. Endy.....	China Grove.
Liberty S. H.....	Miss Daisy Morgan.....	Gold Hill.
Rockwell.....	Mrs. W. J. Cline.....	Gold Hill.
Woodleaf.....	Mrs. C. H. Gillian.....	Woodleaf.
Rutherford.....	Mrs. L. E. Rollins.....	Rutherfordton.
Ellenboro.....	Miss Ida Green.....	Ellenboro.
Sampson.....	Mrs. S. H. Hobbs.....	Clinton.
Garland.....	Mrs. W. B. Lamb.....	Ingold.
Salemberg.....	Mrs. W. J. Jones.....	Salemberg.
Newton Grove.....	Miss Bessie Cox.....	Newton Grove.
Scotland.....	Mrs. J. T. John.....	John Station.
Stanly.....	Miss Irma Richie.....	Richfield.
Big Lick.....	Miss Eva Whitley.....	Mt. Pleasant.
Endy S. H.....	Miss Letha Treece.....	Big Lick.

## LIST OF CHAIRMEN OF WOMEN'S INSTITUTES.

County	Chairman of Committee	Postoffice
Surry:		
Copeland.....	Mrs. J. W. Hancock.....	Rockford.
Pilot Mountain.....	Mrs. R. E. Flippen.....	Pilot Mountain.
Westfield.....	Miss Effie A. Hill.....	Mt. Airy.
Antioch Church.....	Mrs. J. W. Johnson.....	Mt. Airy.
Piney Grove.....	Mrs. J. L. Jackson.....	Mt. Airy.
Swain.....	Mrs. F. H. Smiley.....	Bryson City.
Transylvania.....	Mrs. C. C. Duckworth.....	Brevard.
Union:		
Wingate.....	Mrs. J. R. Brown.....	Wingate.
Waxhaw.....	Miss Tillman.....	Waxhaw.
Prospect.....	Mrs. M. S. Yarborough.....	Monroe.
Indian Trail.....	Mrs. H. W. Abernathy.....	Matthews.
Vance.....	Miss Mary Burwell.....	Kittrell.
Wake.....	Mrs. John Broughton.....	Zebulon.
Warren.....	Mrs. F. P. Bowden.....	Manson.
Washington.....	Mrs. T. A. Brooks.....	Bath.
Aurora.....	Mrs. B. T. Bonner.....	Aurora.
Watauga.....	Mrs. W. E. Shipley.....	Valle Crucis.
Boone.....	Mrs. R. M. Green.....	Boone.
Wayne.....	Mrs. M. A. Howell.....	Goldsboro.
Falling Creek.....	Mrs. E. A. Stevens.....	Goldsboro.
Smith's Chapel.....	Mrs. Joe Parker.....	Mt. Olive.
Wilkes.....	Mrs. Thos. Andrews.....	Wilkesboro.
Beaver Creek.....	Mrs. Chas. Hartley.....	Kendall.
Ronda.....	Mrs. J. I. Dimmette.....	Dimmette.
Traphill.....	Mrs. Nancy Spicer.....	Traphill.
Wilson.....	Mrs. W. J. Sloan.....	Stantonsburg.
Yadkin.....	Mrs. W. H. Hall.....	Yadkinville.
Booneville.....	Mrs. A. S. Speer.....	Booneville.
Yancey.....	Mrs. W. J. Waycaster.....	Bald Creek.

## PROGRAM FOR NORMAL INSTITUTE

July 15, 16 and 17, 1913

## TUESDAY MORNING.

- 9:30. Called to order by Director T. B. Parker.

## MEN'S MEETING.

- 9:30. A Short Description of the Soil Types of the State—J. L. Burgess, M. E. Sherwin.  
 10:15. How Deep Should Land be Broken for Corn and Cotton—C. R. Hudson, C. L. Newman. Discussion.  
 11:00. How Early Should Corn and Cotton be Planted?—C. B. Williams, T. B. Parker. Discussion.  
 11:45. What is the Best Distance to Sow Rows of Corn and What is the Best Spacing in Rows?—G. M. Garren. Discussion.  
 12:30. What is the Best Distance to Have Rows of Cotton and What is the Best Spacing in Rows?—T. D. McLean. Discussion.  
 Adjourn until 2:00 p. m.

## TUESDAY AFTERNOON.

- 2:00. How Deep Should Corn and Cotton be Cultivated?—T. E. Browne. Discussion.  
 2:45. How Often and How Long Should Corn and Cotton be Cultivated?—J. L. Burgess. Discussion.  
 3:30. What Should be the Method of Cultivation of Corn and Cotton after a Wet Spell? Round Table. Discussion.  
 4:00. Does it Pay to Make the Second and Third Application of Fertilizer to Corn and Cotton? If so, When?—B. W. Kilgore. Discussion.  
 4:45. What is the Most Economical Method of Harvesting Corn?—C. L. Newman. Discussion.  
 5:15. When and How Should Stable Manure be Applied?—Round Table.

## WEDNESDAY MORNING, JULY 16.

- 9:00. When Should Land be Broken for Wheat and Other Small Grains?—M. J. Hendricks. Discussion.  
 9:30. What are the Best Varieties of Small Grain for this State and Where should we Obtain Them?—J. L. Burgess. Discussion.  
 10:00. When and How to Sow Crimson Clover, Vetch and Rye in Growing Crops for Winter Cover Crops—T. D. McLean. Discussion.  
 10:45. At What Stage in Growth Should These Crops be Plowed Under for Best Results? And Does Plowing Under Green Crops in Hot Weather Sour Land?—J. L. Burgess, C. B. Williams. Discussion.  
 11:30. How Cheaply can Pork be Grown and What Crops Should be Planted for Economical Pork Production?—D. T. Gray. Discussion.  
 12:15. When Should Grasses be Cut for Dairy Cattle and When for Work Stock to Obtain Best Feeding Value?—R. S. Curtis. Discussion.

## WEDNESDAY AFTERNOON, JULY 16.

- 2:00. What is the Best Method of Saving Peavine and Soy Bean Hay? Round Table. Discussion.  
 2:30. Is Silage a Safe and Economical Feed for Horses and How Many Horses will Justify a Silo?—J. C. McNutt. Discussion.

- 3:00. The Sweet Potato: How to Grow and Harvest. Round Table.  
 3:30. Poultry on the Farm. What Breeds?—E. L. Green. Discussion.  
 4:00. Construction of a Mangum Terrace and When Advisable—C. L. Newman.  
 4:30. Fruit on the Farm. A Good Selection—J. C. Pillsbury.  
 5:00. The Kitchen Vegetable Garden—Detjen.

#### THURSDAY MORNING, JULY 17.

- 9:00. Farm Management—J. M. Johnson.  
 10:00. Coöperation: Different Forms and When Advisable—C. H. Poe, J. L. Rives. Discussion.  
 10:45. Dairying and Dairy Cattle—A. J. Reed, John Robinson.  
 11:30. The Silo and Its Use—W. H. Eaton.  
 12:00. General Instruction to Lecturers—T. B. Parker.

#### WOMEN'S NORMAL INSTITUTE.

JULY 15, 16, 17, 1913.

PROGRAM—9:30 A. M.

- The Qualifications of a Successful Institute Worker—Mrs. Henrietta W. Calvin.  
 The Country Woman and Her Relation to the Home and the Community—Mrs. W. R. Hollowell.  
 The Needs of the Country Woman—Round Table Discussion.  
 Lessons in Bread Making—Mrs. Chas. McKimmon.  
 Household Conveniences—Miss Caroline Phelps.  
 Demonstration, the Fireless Cooker—Mrs. H. W. Calvin.  
 Time-Saving Appliances—Miss Jessie White.  
 Demonstration, Biscuit Making—Miss Louise Mahler.  
 Economies in Cooking—Mrs. J. M. Whitted.  
 Demonstration, Coffee Making—Miss Phelps.  
 Training Farmers' Daughters to be Farmers' Wives—Mrs. R. W. Orr.  
 The Relation of Parents to the Public Schools—Miss Linda Clement.  
 The Care and Training of Children—Miss Carrie Hudgins.  
 The Care of Infants—Mrs. W. R. Hollowell.  
 The Moral Training of Our Children—Mrs. R. W. Orr.  
 Physical and Moral Training of Children—Miss Linda Clements.  
 Rural Life as We Should Make it—Miss Jessie White.  
 Training the Child of Today for the Man or Woman of Tomorrow—Mrs. R. W. Orr.  
 Home Sanitation—Miss Katharine Parker.  
 Health on the Farm—Miss Linda Clement.  
 Subject to be Supplied—Miss Carpenter.  
 Subject to be Supplied—Miss Cairns.  
 Judging Bread—Mrs. Calvin.  
 Judging School Lunches—Mrs. Calvin.  
 Women's Farm Life Convention—Mrs. Charles McKimmon, Chairman, Raleigh.

PROGRAM

OF THE

ELEVENTH ANNUAL

STATE FARMERS' CONVENTION

AND

ROUND-UP INSTITUTE

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PULLEN HALL

A. & M. College, West Raleigh, N. C.

August 26, 27 and 28

1913

**OFFICERS.**

PRESIDENT—S. H. HOBBS, Clinton.

SECRETARY—T. E. BROWNE, West Raleigh.

## PROGRAM.

## TUESDAY, AUGUST 26.—SOIL DAY.

- 10:30 A. M.—Greetings—President D. H. Hill and Commissioner W. A. Graham.  
 Soil Work in the State—By Director B. W. Kilgore, Raleigh, N. C.  
 Do Soils Wear Out?—Prof. C. L. Newman, A. & M. College.  
 How I am Saving Labor by Tillage Implements—W. D. Bosenman, Rocky Mount, N. C.  
 Results of Late Applications of Commercial Fertilizers—By C. B. Williams, North Carolina Experiment Station.  
 Dinner.
- 2 P. M.—Address—C. W. Spruill, President of the Convention.
- 2:30 P. M.—Demonstration of Constructing the Mangum Terrace—By P. H. Mangum, Wake Forest, N. C.
- 3 P. M.—Demonstration in Laying Out, Digging and Placing of Farm Tile—H. M. Lynde, U. S. Department of Agriculture, and Prof. M. E. Sherwin, A. & M. College.
- 7:30 P. M.—Essential Principles of Coöperation—Dean H. C. Price, State University, Columbus, Ohio.  
 Marketing Cotton—By C. J. Brand, U. S. Department of Agriculture.  
 Coöperation in Marketing Fruit Crops—By J. F. Fooshe, *Progressive Farmer*, Raleigh, N. C.  
 Coöperation in Live Stock and in Dairy Products—By A. O. Nelson, Svea, Minn.

## WEDNESDAY, AUGUST 27.—LIVE STOCK DAY.

- 5 A. M.—Trip over College and Station Farms.
- 7:45 A. M.—Judging Farm Mules—By Prof. J. C. McNutt, A. & M. College.
- 8:15 A. M.—Judging Draft Horses—By Schuyler Salisbury, A. & M. College.
- 8:45 A. M.—Judging Hogs—By Dan T. Gray, N. C. Experiment Station.
- 9:30 A. M.—Silage for Beef Cattle—By W. F. Ward, U. S. Department of Agriculture.
- 10:15 A. M.—Development of a Profitable Dairy Herd—By Alvin J. Reed, U. S. Department of Agriculture.
- 11 A. M.—Southern Markets for Beef Cattle and Sheep—By R. S. Curtis, N. C. Experiment Station.
- 11:45 A. M.—Demonstration of Methods of Injecting Hog Cholera Serum—By Dr. B. B. Flowe, State Department of Agriculture.
- 12:30 P. M.—Demonstration in the Recognition of Tuberculosis in Cattle—By Dr. G. A. Roberts, A. & M. College.  
 Dinner.
- 2 P. M.—Public Sale of Berkshires, Poland Chinas and Duroc-Jerseys, held under the management of the North Carolina Swine Breeders' Association.
- 7:30 P. M.—A Message from the Sand Hills—By Hon. Henry A. Page, Aberdeen, N. C.
- 8:30 P. M.—Address—By Hon. A. F. Lever, Chairman Committee on Agriculture, House of Representatives, Washington, D. C.

THURSDAY, AUGUST 28.

- 7:30 A. M.—Practical Demonstration of the Principal Stages in the Production of Peaches and Apples:
1. Methods of "Laying Off" the Orchard.....MR. DETJEN
  2. Planting the Tree, and Its First Pruning....MR. STODDARD
  3. Training the Tree.....PROF. PILLSBURY
  4. Methods of Cultivation and Implements.....PROF. HUTT
  5. "Worming" the Trees.....MR. SHUFORD
  6. Preparation of Bordeaux Mixture.....PROF. FULTON
  7. Preparation of Lime-Sulphur Solutions....PROF. SIERMAN
  8. Spraying the Trees.....MESSRS. HILL AND KLEIN
  9. Picking and Packing the Fruit.....MR. SHAW
- 9:30 A. M.—This Farm Pays: That One Does Not. Why?—By J. M. Johnson, U. S. Department of Agriculture.
- 10:15 A. M.—How to Prevent Cottonseed Meal from Poisoning Hogs—By Prof. W. A. Withers, A. & M. College.
- 11 A. M.—Business Meeting.  
Election of Officers.  
Reports of Committees.

**PROGRAM HOUSEWIVES' CONVENTION.**

At Raleigh High School Building.

MRS. CHARLES MCKIMMON, *Chairman*.MISS JANE WARD, *Secretary*.

The Housewives' Convention is designed to bring housekeepers together for discussion of better methods of living; how best to make the household expenditures, how to market, to cook, to sew, to care for children, and to improve home conditions generally.

Every woman in North Carolina is invited to come, and Dr. Hill, President of the A. and M. College, offers the College Dormitories free to any one wishing to come.

If this offer is to be taken advantage of, sheets, towels and pillow cases should be brought. Meals may be secured at the College at twenty-five cents each.

TUESDAY, AUGUST 26.—10 A. M. to 2 P. M.

Address of Welcome.....MAJ. W. A. GRAHAM  
(Commissioner of Agriculture.)

The Object of the Convention.....MRS. MCKIMMON, *Chairman*

The Power of the Organized Housewife.....MRS. JULIAN HEATH  
(Of N. Y., Founder Housewives League of America.)

Talk on Appetizing Ways of Cooking Meats, with a Demonstration—

MISS EMILY G. BOSSONG (of New York)

Talk on Kitchen and Household Conveniences.

Demonstration Fireless Cooker.

Discussion.

WEDNESDAY, AUGUST 27.—10 A. M. to 2 P. M.

Talk .....T. B. PARKER  
(Director Farmers Institutes.)

Lesson in Bread Making. Anyone invited to join. Please bring

Apron and Dish Towel.....MRS. MCKIMMON

Talk on Batter Breads, with Demonstration in Making Queen of

Muffins .....MISS BOSSONG

The Forgotten Market Basket.....MRS. JULIAN HEATH

How I Made My Crop.....TOMATO CLUB GIRL

Demonstration of Canning in Tin for the Market—

ALAMANCE COUNTY TEAM OF TOMATO CLUB GIRLS

Talk on Soups, with Demonstration.....MISS BOSSONG

THURSDAY, AUGUST 28.—10 A. M. TO 2 P. M.

Lessons in Bread Making.....	MRS. MCKIMMON
Talk .....	D. H. HILL
(President A. & M. College.)	
Talk on Salads, with Demonstration.....	MISS BOSSONG
Coöperation of Women from Town and Country.....	MRS. HEATH
The Care of the Child.....	RALEIGH PHYSICIAN
Fireless Cooker Demonstration.	
Discussion.	

### Some Things I Have Found Helpful in My Own Home.

MRS. HENRY SLAGLE.

As the demands of life are much the same with all of us, necessarily our needs are much the same. I have been a home-keeper for more than twenty-five years and have made it a close study, trying to find the best and easiest way of doing things, and I have much to learn yet. I am always glad to get any new ideas or suggestions from my coworkers, so I will tell first of the arrangement of my kitchen. As I got some of my best ideas from some of our institute workers, I would like to pass them on; someone else might be as glad to get them as I was.

My kitchen is small, 12 by 15 feet. I like to get things as near together as possible. On the west side I have a door with water running right to it. Just outside I have a sink to carry off the waste water. There are two large windows right together which give plenty of light for my range that sits right under them. It is a Queen Kalamazoo range and it cost only \$36.67 delivered at Franklin. A cousin bought a range very much like mine from an agent, and she gave \$75 for hers. We farmer folks do give lots of our money to traveling agents. In this case she gave a little more than twice as much for her stove, and it was not any better than mine. Above the two windows I have an air-shaft as near the overhead ceiling as possible, 25 inches long and 6 inches wide, for an escape for hot air and smoke and fumes. I like it very much, for so often something boils over or something drops on the stove when it is hot and the whole house is filled with smoke; but this opening carries it all off. In the heat of summer the air never gets stuffy. I made a shutter to close in very cold weather, with hinges put on so the door will drop down; then I can close it with a broom handle or a stick of stove wood. I put a piece of wire screen on the outside to keep flies out. Behind my range I have a space three feet between it and the dining room, and on this wall I have a drop shelf fastened to the wall with strap hinges and a strong brace in the middle fastened to the shelf with another strap hinge. The shelf just drops down against the wall and is entirely out of the way until I want to use it, when I lift it up and set the brace on a little block of wood which has been nailed on the wall to support it. This I find very convenient for raising lightbread and for many other purposes. The dining-room door has swinging hinges, so in going to and from the dining-room with both hands full all I have to do is to walk against the door and it will swing open either way.

I also have a large deep cupboard built in the corner right behind where this door opens and just opposite my range. In making one of these get a good workman and then it will always be satisfactory. It is not always the things we get for the least money that prove to be most economical. I got a good carpenter and he made the frame or face of this cupboard of oak that would take a nice finish. He put in a set of slides 3 feet and 3 inches above the floor for two nice deep drawers. One of these I use for all my kitchen trinkets, such as spoons, egg-beaters, broilers, etc., and the other for a meat drawer. I can put a whole ham in it and my meat for seasoning. Nice brass rings for the drawers cost 20 cents. Below the drawers are two doors opening into the lower part where I keep all my pots, pans, muffin rings, etc., and

above are two much longer doors, opening into a number of shelves, where I keep various things, dishes for taking up meals, tea, coffee, spices, starch, soap, and a great many other things, so that I don't have anything hanging on the walls except dish pans; everything is away from dust and flies. Just to the left of this and right up against it is a rather large table on castors that I can move into the middle of the room or before the door to work when it is hot. This table also contains a large drawer for kitchen towels. There is also the meal chest, containing three apartments, each having a separate lid. It stands just 31 inches high. I had it made to suit my height for kneading bread. The chest itself is 15 inches above the floor, the end pieces being cut out of broad plank and shaped to serve as legs.

Then the fireless cooker, last but by no means the least, is a *luxury*. After using one we don't want to do without it; it is so helpful, convenient, and such a comfort. When you want to go to church or anywhere in the morning, just put your dinner in the cooker and there is no danger of its burning, no fires to keep up, and when you get home you have a hot dinner ready to serve. I don't think there is any other way of cooking meats to make them so good. Your roast beef, mutton chops, broiled chicken or anything else is better cooked in the fireless cooker than in any other way.

A sink in the kitchen saves so many steps even if there is no running water in the house; it will save time and opening doors when it is cold. There are many other little conveniences and ways of making work easier that every woman might have if she would study her situation and make the most of her opportunities. She should be an equal partner with her husband in sharing things, good or bad, and if they are able to have improvements on the farm they ought to have them in the house too.

Another important thing my long experience as a mother and housekeeper has taught me is the need of being ready for any emergency. Keep all kinds of medicines and remedies on hand and learn how to use them. We can train ourselves to be dependent or independent as we will. I have raised eight children and Providence has been kind, but if I should tell you how few calls we have had for a doctor you would not believe that I am as great a friend to them as I am. We have called a physician to visit our children in only three cases. We have never lost one, and they are all strong and well now. Of course they have had many little accidents. The worst was with our second son. He was working in the blacksmith shop and had a piece of red-hot iron in the tongs, and when he struck it with the hammer it flew out of the tongs and struck him on the eye, cutting through the lid, and made a slight cut on the ball one-half inch long, not quite reaching the sight. He came to the house with his dirty hand over it and said, "Mother, I have ruined my eye." I looked at it and it did look like it might be ruined sure enough, with the blood running down on his cheek through the smut and dirt off of his hand. But I ran to one of my emergency bottles and got a tablet of bichloride of mercury and put one quart of warm water on it in a basin. Then I got a large clean cloth and swabbed his eye and face off, and for fear I had not gotten it entirely clean I made another solution exactly like the first and went over it again. Next I got a bottle of borax water that I kept for burns and sore throats and wet a good big piece of absorbent cotton and put it on his eye and bound it up. Then I went to the telephone and called the doctor, and as he had just had a call above our home he said he would be along in a little while and bring me a dressing. When I told him what I had done for it, he said I did not need anything else, but I used the borated vaseline that he brought and in one week the eye was ready for the bandage to be taken off, and it never did inflame one particle. The time to save trouble is in the beginning. Always disinfect a hurt, even a small one, right at first. I like to keep a little bag of sterile cloths for binding up wounds, and this is the way I sterilize them. Put one bichloride tablet in one quart of water in a porcelain vessel and then put the cloths in it and boil them. Then dry in the sun and wrap them up carefully in another cloth and they are ready for use. When your little boy sticks a rusty nail in his

foot, put some kind of a disinfectant as quickly as possible into a basin of water just as hot as the child can stand and have him keep it there fifteen minutes anyway. If you don't have bichloride of mercury or carbolic acid or some other good one, put one teaspoonful of copperas into the water; then take out of the water and dry off and drop turpentine into the place as long as it will absorb any and bind it up. It will never give you any trouble. Have your bottle of iodine to paint behind the baby's ear when he takes ear-ache. A few drops of warm water and glycerine in the ear is good. One-half teaspoonful of borax to one glass of water used as a gargle in sore throat always relieves. Add to a five-cent bottle of vaseline one teaspoonful of powdered borax for a dressing for burns. One teaspoonful of boracic acid (this is the refined borax) added to one-half pint of water and brought to a boil (then cooled and bottled) is one of the best eye washes at all. It will relieve any burning or soreness of the eyes. This should always be used in an infant's eyes at birth and every morning until the child is a few weeks old. Many make a weak solution of this and swab out the mouth every morning to prevent thrush.

NOTE BY T. B. PARKER.—Bichloride of mercury is a valuable family medicine; it is also a deadly poison and should be treated as such by keeping it and all other poisons under lock and key where children can not get to them.

Every poison should be labeled as such and have its name in big letters so you may know just what it is, and kept entirely away from the ordinary household remedies, so as to prevent mistakes that may cause death.

Within the last year we have heard of several instances of bichloride of mercury being taken for headache tablets, through mistake, with fatal results. We can not be too careful about poisons. Great sorrow and affliction have come to many families on account of carelessness in this respect. Either lock them up or throw them away where they can do no harm. It will be well to have posted in a conspicuous place where poisons are kept a notice like this (written by Dr. Harvey W. Wiley) (which I have copied from the December number of *Good Housekeeping*):

#### FIRST AID IN POISONING.

Paste this in your medicine chest. Number your poison bottles to correspond to the numbers given here; then you can tell at a glance what antidote to give or take.

- |   |   |
|---|---|
| <p>1. ARSENIC (Fowler's solution, Arsenic Trioxid, Cuprous Arsenite).</p> | <p>1. Give a tablespoonful of mustard and salt in a glass of warm water, or thirty grains of zinc sulphate, or evacuate the stomach with a pump. Afterward give one tablespoonful of ferric hydrate every fifteen minutes, or same quantity of dialyzed iron. Apply external heat and stimulants.</p> |
| <p>2. ACETANILID AND PHENACETIN (nearly all headache remedies).</p>       | <p>2. Symptoms, cyanosis (blue lips), weak pulse, sweating. Lower head; apply heat to body; if stimulants are required, give whiskey, strychnin, or belladonna, and oxygen inhalations.</p>   |
| <p>3. AMMONIA OR CAUSTIC POTASH OR SODA.</p>                              | <p>3. Give dilute acid (lemon juice in water or vinegar). Afterward plenty of milk and eggs or olive oil.</p>   |

4. BICHLORIDE OF MERCURY.
5. BELLADONNA OR ATROPIN.
6. CARBOLIC ACID (Phenol).
7. CHLORAL AND CHLOROFORM.
8. COCAINE.
9. IODIN.
10. MORPHINE, SULPHATE, OPIUM, AND PAREGORIC.
11. MINERAL ACIDS.
12. PHOSPHOROUS.
13. STRYCHNINE.
14. ILLUMINATING GAS.
4. Give a tablespoonful of mustard and salt in a glass of warm water, or thirty grains of zinc sulphate. Afterwards milk and eggs. If in collapse, use heat and stimulants.
5. Give a tablespoonful of mustard and salt in warm water. After vomiting, one-quarter grain of morphin sulphate. Stimulants if required.
6. Flour and water; use stomach pump or give one ounce of Epsom salts, or two to four ounces of whiskey or slightly diluted alcohol. If in collapse, add heat to body.
7. External heat, keep head low, use stomach pump or give emetic of half an ounce of mustard and salt in warm water. Friction to body. Hot black coffee.
8. Stimulants: Nitrate of Amyl, brandy or aromatic spirits of ammonia. Black coffee, external friction.
9. Starch made into drafts with cold water. Stomach pump or tablespoonful of mustard in a glass of water.
10. Stomach pump or tablespoonful of mustard and salt or grease in warm water. Potassium permanganate, ten grains in glass of water. Black coffee. Keep patient awake. Supply heat. If stimulation is required, use atropin or strychnin.
11. Stomach pump, alkalies, as magnesium carbonate or baking soda, also milk, sweet oil or eggs. Heat or stimulants, if required.
12. Stomach pump, or three grains of copper sulphate in water every fifteen minutes until vomiting is induced, or thirty drops of oil of turpentine every quarter hour for four doses. Give purge. Avoid fats and oils.
13. Stomach pump or a tablespoonful of mustard and salt in warm water. Keep patient quiet. Seven to ten grains of tannic acid. For convulsions use chloral or chloroform. Inhale amyl nitrate.
14. Remove patient to fresh air. Give oxygen to inhale. Use pulmotor or some form of artificial respiration. Supply warmth to extremities.

*Good Housekeeping* ought to do as much as possible to put an end to these unfortunate fatalities. First of all, segregate all poisonous drugs in the household, as advised before. Second, study some simple remedies which may be applied in case of poisoning by the common poisons until medical attendance can be secured. To this end a page has been prepared of some common poisons, with a few of their simple antidotes. The readers of *Good Housekeeping* magazine are requested to cut this page out and paste it plainly in every closet or cupboard in which deadly drugs are kept. Not only should each reader do this, but the remedies and antidotes should be clearly kept in memory.

#### STOMACH PUMPS AND ANTIDOTES.

As a rule the first thing to do when a poisonous dose has been swallowed is to empty the stomach. A stomach pump does not cost very much, and its operation is extremely simple. Every family should be provided with one, or else make sure that one is easily accessible in the immediate neighborhood. A stomach pump is to be preferred to the ordinary emetics. It may not, however, always be possible to secure one. For this reason it is advised that a few household emetics be kept on hand.

A spoonful of powdered mustard to which a considerable quantity of common salt has been added, suspended in warm water, makes a very effectual and reasonably prompt emetic. In fact, emesis as a rule can be easily and promptly secured by drinking copious drafts of lukewarm water, almost saturated with salt. The mustard, however, renders the emesis still more prompt. This simple method of producing emesis is to be preferred to the use of sulphate of zinc or other mineral emetics. The mineral emetics are, however, very prompt and are easily kept on hand, zinc sulphate being the one usually recommended. Epecac can be easily kept and is also efficient. Thus it is seen that the first step in case of poisoning is to evacuate the stomach, preferably by mechanical means, otherwise by emetics which are easily kept in every household.

After this, the proper antidotes are to be administered. It would be a wise plan for the housekeeper to keep on hand some of these common antidotes. For instance, arsenic poisoning is very common, and the best antidote for arsenic poisoning is hydrate of iron, that is, an iron salt precipitated with ammonia. The efficiency of this remedy, however, largely depends upon its freshness. It therefore can not be kept ready, and in lieu thereof the housekeeper should have the simple ingredients for making it. Two bottles, one holding a solution of ferric sulphate and the other magnesium oxid, suspended in water, are easily kept, and can be prepared by the druggist of such strength that, when mixed, the ferric hydrate is completely precipitated. When these two solutions are mixed together and thoroughly shaken, they are ready at once for administration in arsenic poisoning, and if promptly used would save many lives. This mixture of iron hydrate should be given in large doses and frequently repeated.

Vinegar, which is a splendid antidote for caustic potash and ammonia, is always available. The best stimulants, as a rule, are whiskey, and, in some cases, caffeine or hot coffee. It is not advisable to keep on hand such stimulants as strychnin or chloral or chloroform, which are themselves poisons. They can, however, be promptly secured at any neighboring drug store, though perhaps no more quickly than a physician could be called.

#### THE NEED FOR CARE.

Families are, of course, not expected to keep in stock apparatus for the inhaling of oxygen, or to be possessors of a pulmotor. It is the part of wisdom, however, for every one to know where such an apparatus can be obtained for these purposes, so that in case of asphyxiation or other paralysis of the nerves and muscles which control respiration artificial breathing can be set up. This is particularly true in those numerous cases of poisonings due to the inhalation of illuminating gas.

Let every household into which *Good Housekeeping* goes have all of these poisons segregated and properly marked. Have the list of poisons and their simple antidotes pasted in plain view, and know where an oxygen inhaler and pulmotor can be secured promptly in case of emergency. By these wise precautions many lives may be saved.

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### The Country Home.

MISS CARRIE HUDGINS.

The word home carries with it music and melody if it is a home in the finer sense. Houses on every hand are waiting to be made into homes, and it is the woman in the home who makes it what it is; so let us be up and doing.

A casual glance at the home and refinement and cleanliness should be our first and lasting impression. No work requires more system and order than the home, to accomplish the desired end; many steps are wasted because no specific plans are made. Eliminate from the home the useless bric-a-brac of years ago. They are no good and mean lots of work if they are kept clean, for they are great dust-catchers.

Floors are one of the greatest problems of housekeeping and rightly so, if there is a large family to look after and scouring to be done once or twice a week. Stained floors with a top dressing of floor oil seems to be the cheapest and most satisfactory floor dressing. A floor oiled once or twice a year will protect the stain and keep down the dust.

How the whole family dread spring cleaning. Let's try to do this work in a more systematic way; not have the whole house torn up for a week, and everything out of its place. A better plan is to clean one room at the time, and put it in order before attempting another. Carpets should be taken up, well cleaned and aired before replacing.

In buying furniture care should be taken, for the appearance of the room and the amount of labor required to keep it in order depend much on the selection. Plain furniture is much prettier and more easily kept than the many scrolled designs. The parlor in many homes is the most uncomfortable room in it; especially so if it is one of the closed up kind, where fresh air and sunshine are rarely permitted. Don't be afraid of sunshine and air even if they do fade the carpet and wall paper. It is one of God's greatest blessings to us; so let it in.

Look out for an air of comfort for the living room; here is where the family come together for rest and recreation, and if it is not found here it will be sought at other places. The children obtain their lasting impressions of the home and begin to lay plans for another home perhaps in the far future.

The yard requires taste and skill as much so as the inner furnishings of the house. Every yard can't have a beautiful lawn laid off symmetrically with the shrubbery clumped here and there; however, every one can be clean with no rubbish around; flowers may adorn it with little or no expense.

In the country home is found the opportunity for children to be trained in every line of home-making. After all, the most attractive part of the home is the family who live in it.

The children, as Cornelius once said, are the most precious jewels, and in them lie the possibilities of mankind. Not for one moment can we afford to neglect this training for anything else. Just how old the child should be when this training should begin depends on the child. Few of us begin early enough. When the little one climbs up in the chair and wants to help wash dishes, or insists on sweeping the floor, often we are tempted to say, "Run along, you will break the dishes, or make more trash than you clean up." Right there the mistake is made, for if we continue to push them off they will cease to come and offer a helping hand, but will be content to go along and let mother do the work.

How proud mothers are of their domestic girls, and fathers of their sons

who love the home and are willing to stay on the farm! And justly so. Our boys and girls should feel that they are a part of the home early in life, with some specific duty to perform each day.

To me one of the greatest responsibilities of child-training is their intense desire to do as *we do* and not as we *say do*. An instructor on one occasion was making a bed for a little one, charging her to imitate her the next morning and be very careful and not leave one thing undone. By accident, one of the pillows was knocked out of the window, where it had been placed while the bed was being made. On the following morning the little one showed she had grasped many of the instructor's suggestions, and with a few aids here and there the bed was ready for the pillows. She went to the window and deliberately knocked one out saying, "You thought you'd catch me, but you see I remembered you knocked yours out and I've done it too." This is often the case: we are imitated in the wrong place; so it behooves us to always be on the alert.

Some one has said housekeepers are born, not made. While we know this is not always true, we realize every day that to make our daughters proficient requires time and patience. Often a careless boy or girl will awake by watching nature; interest the children in growing flowers. They will relieve you and it will be such a pleasure to them to know they are doing something toward beautifying the home.

The country home where love and contentment reign is one to be envied, the home that belongs to the whole family, each one trying to make it a perfect one, each one looking after the comfort and pleasure of the other.

The country school teacher can plant many seed in the young mind that will be carried home. Interest the children in beautifying the schoolhouse and grounds, and soon you will see the fruit of your labors developing in the homes.

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### Pin Money Possibilities on the Farm.

MISS LINDA CLEMENT.

The chiefest source of a woman's farm revenue has always been her eggs, chickens and butter. One is almost justifiable in believing that a man who will carry to market, dispose of and pocket the price, provided his wife's labor was expended in the production of these articles, is nothing short of a ——. At any rate, the average farmer isn't guilty—there are few grafters in the profession, and almost to a man they consider it a privilege to make possible an earning capacity for wife and daughter. If they are progressive farmers, nothing short of the best material finds a lodging place on their farms, and if the women are going in for fowl culture nothing save a thoroughbred flock shall mark the beginning.

A venture in poultry designates chickens as the original flock. The disposition one intends to make of them would influence the selecting of a breed. If you wish to grow broilers or friers, you want a heavy, fat chicken which grows off rapidly; if you wish to gain your profit from eggs, you would choose one of the slender-bodied laying strains. A reputable poultry journal is a very necessary part of the outfit, and an eye alert to market demands must supplement all other information gained. Keep an accurate account of expenditures for first year and do not invest in expensive equipment nor add too large a flock of turkeys, guineas or ducks until your experience with your small flock of chickens shows your selling price tallying or indicating a margin above cost of production. Too many poultry plungers fail because their original investments in tremendous flocks and costly furnishings haven't the stability and insurance of past experience to make them profitably go. After your small return has produced a result, you are in need of a consumer. Never sell through a commission firm; you are entitled to the entire profits. Develop your business capacity by hunting your own markets, and once found, make them regular customers by furnishing only extra select stock. Let them learn they can depend on you for promptness and straight

dealing. Hotels and colleges hold yearly contracts with farm individuals for poultry, butter and eggs. If they demand two-pound chickens, assort yours and send them *only two-pounders*: if white eggs are their choice, send them only white ones and reserve your tans and creams for another market. In the commercial world, we are told, the distinguishing mark of an American is that "he wants what he wants when he wants it," and he is willing to pay the price of his whims and impatience. So never argue with a customer that he wants something else, but cater to his eccentricities and restlessness since he doesn't count the cost.

In marketing your eggs, pack in cartons bearing your name and trademark and build your reputation on that trademark. Never sell an egg that has been gathered longer than three days; do not market your dirty eggs, rots, spots or dwarfs.

Increase yearly with your profits your flock of birds. Keep those that are especially strong and have bred true to color, size and other favorable requirements. Adaptability of breed for purpose desired would also influence the person's selection of a cow, when considering the possibility of profitable returns from the milk or butter industry. Just any old cow is not a dairy cow. Select a Jersey, Holstein or any standard strain of butter or milk producer. Begin at the beginning—to use a hackneyed expression—and learn the business from the inside out and from the outside in. Send for a government bulletin or attend a four or five days government dairying demonstration taking place in your town or the neighboring. Learn the nutritive value of the foods you feed your cows and learn to keep a record of and make tests of your milk. Follow minutely government formula for perfect butter, and produce a creamery variety which the year round nets you thirty-five cents a pound instead of the poorer product which retails at ten or fifteen cents. Remember there is no profitable return in money value in producing an inferior grade of anything.

The tomato clubs that have recently been organized in nearly all parts of the State, with a desire and hope of increasing the "Pin Money Possibilities" on the farm, may prove delusive unless the strictest regard is given to the instructions sent out by those who are in charge of this work. The best of tomatoes, the best methods of putting them up and absolute cleanliness should be strictly adhered to. If these essentials are disregarded the country may be threatened to become glutted with canned goods that the trade nor the consumer will want. If on account of this off-grade stuff the prices should drop to 60 or 75 cents per dozen, which is not improbable, the business could not be considered at all remunerative. It would pay far better to not can tomatoes at all, or only enough for home consumption, than to put them up at a loss. The farm woman finds sufficient for her hands to do without unprofitable or superfluous labor. But the woman on the farm who puts up only good stock and receives one dollar and twenty cents per dozen for her entire canned output is declaring a dividend, and she'll declare a still larger if she's a human market barometer. She'll grow two crops of tomatoes, and like some of our big peach, apricot and cherry producers, her canning outfit will be insurance for that part of the crop which fails a raw market. A store tomato, the standard canning variety, is a midsummer ripener and can not be successfully forced for an extremely early market. From my own personal experience I prefer a Langdon Earliana, a variety which has been on the market six or seven years. My Langdons, under conditions both favorable and unfavorable, have ripened from one week to ten days earlier than the standard earlies, and were ready for market when Florida tomatoes were still bringing fifty cents a basket.

To one interested in a canned goods market, a variety of fruits and vegetables rather than a dependence on just one, as the tomatoes, means more in profitable returns and finds readier sales. Of the vegetables maturing within the season in which planted, the English green pea, when properly canned, brings the most substantial price, ranging from \$1.60 to \$2 per dozen. Canned asparagus holds a market, at a price above other vegetables, and on a par

with most of the California fruits. It requires three summers for an asparagus bed to reach maturity if grown from seeds. Still, when one considers that when once established it lasts indefinitely, the cultivation and patient waiting is worth the while. All asparagus for canning should be bleached and all stalks should be of a uniform size and length. If your canned product meets all market requirements, you should receive from \$2.50 to \$3 per dozen for your asparagus. Select varieties of peach, apricot, pears and berries commanding a good market at high prices, home-canned goods do not have to compete with canning factories, for they are always preferable and command, therefore, a better price. But, remember, just any old stuff you sling together doesn't find a waiting market. Grade everything you sell; use only perfect fruits and vegetables either for the raw market or cans. Build your reputation on perfection of flavor, cleanliness and honest weight. Specialize, if you care to, on some one fruit or vegetable, but be sure it's one the market isn't easily satiated with—fig preserves, sweet pickled figs, sweet pickled cantaloupes or peaches—something of this kind.

A Virginia woman built a factory from a tiny kitchen, and a fortune from a paltry investment, not only because by intuition she discerned that "Pin Money Pickles" would tickle the palate of a nation, but because every pickle she afterwards produced partook in size, flavor and perfection of that first delectable. Reputations are sometimes acquired by accident, but it's another thing to live up to them, and the rule holds good in a commercial sense.

In the profitable realm of the vegetable world there are waiting opportunities with the expenditure of a few cents for seeds, good earnest labor for cultivation, hard common sense for markets, and the farm woman need be no beggar. Earning one's spending money gives woman a confidence and added respect in and for her own capabilities. There are each day avenues multitudinous opening for the feminine farmer who would and will earn her way. There are bee farms, flower beds, early transplanted plants, lettuce farms, and home-made dainties galore. The "bide at home" woman has proven her capacity, and her profession will continue to grow.

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### It Pays to Think.

LUCIE T. WEBB.

The thinking farmer is the one who is making good today. It is he who considers the effect of every lick; who studies his soil and by the use of modern methods, with an equal amount of labor, increases the yield from two to fourfold. It is the thinking woman who accomplishes in one day by thought and system what her neighbor does in two. Yet how few of our women think. They go into the day's work with an indistinct idea of the myriads of things to be done, jumbled together, with no plan, no outline in the mind's eye; no grouping of tasks so that two and three things may be done at the same time; no regard for short cuts and easy ways; and, most of all, with no consideration whatever for their own strength and physical endurance. They stand through countless opportunities to sit and rest the tired feet. They trot from one place to another in an aimless way, making many trips where one should answer. All because they do not think.

A woman's life on the farm at its best is hard; how hard no one but the one who has lived it without hired help knows. Much of the drudgery can not be eliminated, even by a world of system. There are meals to cook, dishes to wash, beds to make, floors to sweep, milk to churn, vegetables to gather, fruit to save, water to bring, and sometimes, I am sorry to say, wood to cut, pigs to feed, and cows to milk. This is hardly a beginning of the daily tasks that confront her; and when there are babies to care for I often wonder that she is alive to tell the story. Surely then, if there is any help to be had in thinking, the farm woman needs to *think*. Else she can not greet her tired husband when night comes with a well-kept home, good food, and, best of all, a cheery smile.

Conditions are different in every home, therefore the woman herself must study these conditions and solve her own problems the best she can. Let her have ever before her the one thought—*save steps*. Children are great step-savers for mother; the exercise and training is good for them. Not hard work for the little ones, but they enjoy seeing "who can pick up mamma's thread first," or "who can bring a spoon from the dining-room the quickest." A large waiter is also a great help, almost an entire meal can be carried to the table at one trip, or all of the dishes brought in from the dining-room when ordinarily one goes back and forth a number of times. Take the waiter to the pantry and while resting a minute on the meat box make a calculation of all the things needed in preparing the meal and, piling them on the waiter, carry them all to the kitchen at one time. Now rest again, this time in the kitchen rocking chair, and calculate how many steps you have saved. A small table can be placed close to the kitchen stove on the left-hand side and on it kept a jar of lard, some sugar, salt, pepper, a knife, fork, spoon, stove-lifter, etc.; this keeps one from going back and forth across the room to the kitchen table. Again, a wheelbarrow may be used to advantage in hauling stove-wood, one trip bringing enough to last a whole day. Or taken to the garden for vegetables, often this saves a half-dozen journeys. By all means, have the garden near the back of the house. I know I have, in days gone by, walked hundreds of miles to a garden off from the house out of reach of the chickens.

There are other ways, at a small expense, the housewife may save herself an untold amount of labor. A kitchen sink at a cost of from three to five dollars will be worth its weight in gold. A fireless cooker, an oil stove, linoleum on the kitchen floor, and where it can be done, a convenient water supply could be had in most of our homes if the housewife started in with the determination to *have them*.

As a parting word let me say, *save your feet*. Every woman will say her feet are more tired than anywhere else when night comes. Then she should sit down and work whenever it is possible; and in the winter, if the kitchen stove is the only chance to warm them, put a warm brick under each foot as she peels the potatoes, wipes the dishes, or picks the chicken.

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### Factors That Will Enter Largely Into the Betterment of North Carolina Agriculture.

A. L. FRENCH.

Every thinking citizen of North Carolina realizes the importance of our premier industry—agriculture. From the west line of Cherokee County to where the waters of Old Ocean beat upon the thin strip of land at the lower end of Currituck, that divide them from those of Albemarle Sound, men and women are found busily engaged in winning a living, and something for a rainy day, from the soil.

These men and women are our leading citizens; for they are engaged in the most important industry of ours, or any other State. And the young men and women that are, in the next generation, to take up and carry on the work of their fathers and mothers on the land are the most important factors that will enter into the betterment of the State's agriculture.

How important then that the training of these young lives be along lines that will enable them to dignify the work of their fathers and improve upon it to the degree that the increase of the world's population demands.

This training the writer believes should be the work first of the fathers and mothers on the farm. They should be trained from their infancy in the need for a better care of the soil and its more economical handling. Then as they arrive at school age the State should, while training them to develop their minds, strive to keep ever before them the principles that their parents have planted and tended before they were given into the State's keeping.

This means an agricultural education for every boy and girl that is raised upon the farms of the State; an education, by the way, that unfits them in no way for any other business that they may choose to take up later; for a brain training founded upon the great principles that pertain to the soil will be one of the best foundations upon which to rear an educational structure that will fit for any other business or profession. And the hope of the country as I see it is to make of farm boys and girls farmers first, then let the surplus go to other callings; for the greatest need of our State today is better farmers. The greatest work that lies at the door of these better farmers of the future is the improvement of the soils of our State; for it is a fact that while our gross income from the lands of the State amounts to vast sums yearly, yet not half of the acres upon which our products are produced—because of a depleted condition—pay a living wage to the men handling them. This can mean nothing else than poverty to the farming people. And a people continuing in poverty generation after generation lose courage and ambition, and a consequent lowering of their standard of living and citizenship is inevitable.

This condition among those responsible for the care of our greatest industry can never be tolerated. Our new farmers must study and experiment until they learn how—by better drainage, better tillage, better fertilization, more economical working, and a better handling of necessary capital—to put these border acres into the profit-giving column; make them produce a greater yield each year at no greater expense, and cause them to increase from year to year in natural stored-up fertility. And then will the present generation be more economically fed and clothed and the heritage of future generations be conserved.

These young men and women of the future must be brought to realize clearly that upon them rests very largely the conservation of our great natural resource called water-power; for while the State and nation in the coming years may spend vast sums of the people's money in reforesting the mountains and building great reservoirs for the control of surplus water, yet upon them—the men and women having the control of the farming lands of the State—must fall the great bulk of the work of regulating the flow of surplus water.

The farming lands of the State must be so thoroughly underdrained, so well broken, so completely filled with vegetable matter, and the rougher portions of the farms so constantly covered with grass that surplus water will—the greater part of it—be made to seep through the land and thus leave gradually, rather than to rush off the surface of the soil to swell the creeks and rivers to the bursting point.

Upon the farmers and their wives of the future will fall in a large degree the work of beautifying our State, cultivating her natural resources, for beauty that is second to no State in the Union. Our unsightly patches of cultivated lands must be broadened and lengthened until they meet, forming broad areas of well-tilled fields. Our unprofitable, brush-grown gullies and galled hills must be made to lend beauty to the landscape by presenting an unbroken expanse of rich green, profit-giving grass. And upon these pastures the unlovely scrub animal must give place to the man-moulded, beautiful, well-bred cow, horse, sheep, and hog.

The farm homes of these future farmers will reflect their culture and prosperity, and the open country from Currituck to Cherokee will give abundant evidence that our State has recognized the importance of her greatest natural resource—the soil—and has given thought to the training of the people in the land; has given to agriculture the dignity that its importance warrants.

## Variations in High Yielding Varieties of Cotton.

JAMES M. GRAY.

In this report the records for the year of 1903 and 1909, inclusive, of the North Carolina Test Farms have been used. Most of the information is from the Iredell and Edgecombe farms, but the records from the Red Springs farm were used for the three years this farm was in operation (1903-1905).

In the experiments, from which the data for this report were gathered, the fertilizers used were the same on each farm. A  $7-2\frac{1}{2}-2\frac{1}{2}$  formula was used practically all the way through the series. The preparation of the land and the subsequent cultivation was the same in each instance. The land was broken with a two-horse plow eight to ten inches deep early in the spring and harrowed just before planting. The cultivation was frequent and shallow.

On the Edgecombe farm the land is a Norfolk Sandy Loam, varying in depth from 6 to 24 inches, with an average depth of about 12 inches. This soil holds manure fairly well and gives a yield of about a bale and a quarter of cotton without heavy fertilization. The seasons are of good length for the maturing of cotton.

The lands of the Red Springs farm are similar to those of the Edgecombe farm, Norfolk Sandy Loam, but less fertile naturally. The season is somewhat longer and warmer than at the Edgecombe farm. These two farms have approximately ideal conditions for cotton growing.

The soil of the Iredell farm is almost entirely Cecil Clay with some Clay Loam. The seasons are rather short for cotton, the farm being on the extreme northern border of the cotton belt. Commercially, cotton is not grown in this section to any great extent.

In this report the following varieties will be used for comparison: Russell's Big Boll, Culpepper's Improved, King's Improved, Excelsior Prolific, Edgeworth, Cook's Improved, and Simpkins's Improved. As will be seen, the Edgeworth variety was the only variety run through a series of six years on more than one farm. This irregularity in the tests made prevents the conclusions from being as definite as they might otherwise have been.

### DESCRIPTION OF VARIETIES TESTED.

Russell's Big Boll is a hardy, large balled and vigorous cotton that yields well on a loam or sandy soil in Eastern North Carolina. It is very popular with the pickers because of the ease and rapidity with which it can be picked. Under average conditions this variety is not only prolific, but fairly reliable. During a seven years test with the above mentioned varieties it stood third on the Edgecombe farm, giving an average yield of 462.72 pounds of lint per acre.

Culpepper's Improved, a large balled variety, is about ten days earlier than Russell's Big Balled. It has a large weed with spreading limbs, well balled and holds cotton well. It is more variable than is Russell's Big Boll, but, notwithstanding this, in the seven years test it stood second on the Edgecombe farm with an average production of 471.97 pounds of lint per acre.

King's Improved has a smaller boll than either of the aforementioned varieties but runs a little higher in per cent of lint, averaging on the three farms 38.16 per cent for the seven years test. It has a rather small stalk with spreading limbs fairly well fruited.

Excelsior Prolific has large, deep lobed leaves and short, well matured limbs that bear a rather small boll of high percentage of lint. It often runs above 40 per cent lint, but because of its variability the average would be somewhat under this. On the Edgecombe farm it gave an average yield of 528.86 pounds, leading all others.

Edgeworth has a rather heavy stalk, is short limbed with large leaves and is rather late in maturing. It runs about 34 per cent lint.

Cook's Improved has large plants, heavily limbed, the lower limbs very long and open; bolls medium size but long, slender and tapering; rather late in maturing. The percentage of lint for a period of six years averaged 39.02. This cotton seems to give a slightly higher per cent of lint on heavy soils than on light soils.

Simpkins's Improved is a small stalked, short limbed variety; a rather heavy fruiter, mediumly early maturing; but maturing at one time rather than continuously, and for this reason is not very well liked where there is a scarcity of pickers. The bolls are small and do not hold the lint very well.

The following table gives the yearly yields of these different varieties of cotton on the different test farms of the State covering a period of seven years.

	1903	1904	1905	1906	1907	1908	1909
Russell's Big Boll:							
Edgecombe Farm.....	554.53	409.44	616.36	682.61	328.07	362.50	287.52
Red Springs Farm.....	367.87	291.32	199.05	-----	-----	-----	-----
Iredell Farm.....	-----	224.32	279.39	-----	-----	-----	289.85
Culpepper's Improved:							
Edgecombe Farm.....	425.83	368.51	671.72	699.30	373.40	313.30	451.71
Red Springs Farm.....	456.87	343.45	237.51	-----	-----	-----	-----
Iredell Farm.....	-----	217.04	276.36	335.25	198.10	-----	351.19
King's Improved:							
Edgecombe Farm.....	323.91	541.51	667.59	-----	344.30	324.80	448.95
Red Springs Farm.....	355.45	330.28	198.23	-----	-----	-----	-----
Iredell Farm.....	-----	247.85	400.69	317.18	350.60	509.70	373.12
Excelsior Prolific:							
Edgecombe Farm.....	-----	592.86	623.87	719.10	-----	265.50	443.00
Red Springs Farm.....	335.70	383.41	216.57	-----	-----	-----	-----
Iredell Farm.....	-----	168.39	296.88	316.56	-----	359.00	342.00
Edgeworth:							
Edgecombe Farm.....	-----	598.86	577.59	525.60	401.80	288.10	357.02
Red Springs Farm.....	-----	332.52	182.41	-----	-----	-----	-----
Iredell Farm.....	-----	221.31	268.58	307.28	233.70	359.00	320.32
Cook's Improved:							
Edgecombe Farm.....	-----	-----	674.36	681.87	519.60	374.40	469.85
Red Springs Farm.....	-----	-----	278.21	-----	-----	-----	-----
Iredell Farm.....	-----	-----	284.05	352.78	-----	455.00	291.75
Simpkins' Prolific:							
Edgecombe Farm.....	-----	-----	-----	-----	342.80	341.50	426.75
Red Springs Farm.....	*	-----	-----	-----	-----	-----	-----
Iredell Farm.....	-----	-----	-----	-----	-----	402.40	360.03

\*Farm discontinued 1905.

From a study of these figures it will be seen that there is a rather wide range of variations in yields of each variety on the same soils and on different soils. It is natural that there should be some variation on soils of different types, but it seems rather striking that there should be such a wide variation on the same soil when the culture and the fertilizers were the same. The climatic changes would, of course, affect the crops of different years somewhat, but hardly enough to justify such a wide variation. The fault would seem to lie with the seed more than anything else. Presumably not enough care was taken in the selection of seed and the quality of seed used.

The following table will help to bring out the variation more forcefully:

	Edgecombe Farm	Year	Red Springs Farm	Year	Iredell Farm	Year
Russell's Big Boll:						
Highest yield.....	682.61	1906	367.87	1903	289.85	1909
Lowest yield.....	287.52	1909	199.05	1905	224.32	1904
Difference.....	395.09	-----	168.82	-----	65.53	-----
Culpepper's Improved:						
Highest yield.....	699.30	1906	456.98	1903	351.19	1909
Lowest yield.....	313.30	1908	237.51	1905	198.10	1907
Difference.....	386.00	-----	219.47	-----	153.09	-----
King's Improved:						
Highest yield.....	667.59	1905	355.48	1903	509.70	1908
Lowest yield.....	323.91	1903	198.23	1905	247.85	1904
Difference.....	343.58	-----	157.25	-----	261.85	-----
Excelsior Prolific:						
Highest yield.....	719.10	1906	383.41	1904	359.00	1908
Lowest yield.....	265.50	1908	216.57	1905	168.39	1904
Difference.....	453.60	-----	166.84	-----	190.61	-----
Edgeworth:						
Highest yield.....	625.60	1906	332.52	1904	359.00	1908
Lowest yield.....	288.10	1908	182.41	1905	221.31	1904
Difference.....	337.50	-----	150.11	-----	137.69	-----
Cook's Improved:						
Highest yield.....	681.87	1906	278.21	1905	455.00	1908
Lowest yield.....	374.40	1908	*	-----	284.05	1904
Difference.....	307.47	-----	-----	-----	170.95	-----
Simpkins' Improved:						
Highest yield.....	426.75	1909	†	-----	402.40	1908
Lowest yield.....	341.50	1908	-----	-----	360.03	1909
Difference.....	85.25	-----	-----	-----	42.37	-----

\*One year only. †Farm discontinued.

A study of this table shows that on the Edgecombe farm there was a much wider range of variation than on either of the others, the Red Springs farm coming second and the Iredell farm giving the least variation. Although the test on the Edgecombe farm gave the widest variations, they also gave the greatest aggregate yield for the period over which the tests were run. This would teach that, if one could obviate this wide variation and still retain the high yielding quality of some of the best varieties of cotton, the section of country adjacent to the Edgecombe farm would be the greatest cotton section of the State. It is entirely possible that this can be done by a system of careful seed selection.

Another striking contrast brought out by these figures is the comparison of yields for the same year on the Edgecombe and Iredell farms. With the exception of Culpepper's Improved, all the varieties gave their largest yields on the Iredell farm the same year that they gave their smallest yields on the Edgecombe farm. Just why this should be is not known. The season of 1908 was very late and this may have affected the growth of cotton more

on the Edgcombe farm than on the Iredell farm, since the cotton was planted on the Edgcombe farm several weeks earlier than on the Iredell farm. And, again, the quality of the seed might have contributed to this difference as seed were not from the same source.

Just here it might be interesting to note the averages of the different varieties on the same soil and on different soils. The following table will aid in this comparison.

	Average for all Farms	Average for Edgcombe	Average for Red Springs	Average for Iredell
Russell's Big Boll.....	337.77	462.72	286.08	264.52
		7 yrs.	3 yrs.	3 yrs.
Culpepper's Improved.....	361.16	471.97	345.95	265.58
		7 yrs.	3 yrs.	5 yrs.
King's Improved.....	367.67	441.84	294.65	366.52
		6 yrs.	3 yrs.	6 yrs.
Excelsior Prolific.....	379.10	528.86	311.89	296.56
		5 yrs.	3 yrs.	5 yrs.
Edgeworth.....	339.11	474.83	257.46	285.04
		6 yrs.	2 yrs.	6 yrs.
Cook's Improved.....	362.70	468.01	278.21	345.87
		5 yrs.	1 yr.	4 yrs.
Simpkins' Improved.....	375.78	370.35	-----	381.21
		3 yrs.		2 yrs.

From first glance the difference as brought out by this table would not amount to so very much: in the average for all the farms there is only a difference of 41.33 pounds between the highest and the lowest; on the Edgcombe farm there is a difference of just 157.71 pounds; on the Red Springs farm the difference is 88.48 pounds, and on the Iredell farm the difference is 116.69 pounds between the highest and the lowest yielding varieties. On studying these figures more closely this difference is of decided importance when they are applied to the actual production of cotton in the State or on the individual farm. Just to illustrate: in North Carolina there are about 1,624,000 acres in cotton. If the whole acreage had been in Russell's Big Boll, which gave the lowest average, instead of Excelsior Prolific, which gave the highest average, the loss to the State would have been \$7,955,040. (Allowing the price of cotton to be 12 cents.) Again, suppose the average farm contains fifty acres of cotton, and that the lowest yielding variety is being planted in each locality, the difference between Simpkins's Improved (the lowest) and Excelsior Prolific (the highest) was 158.51 pounds per acre; this would have resulted in a loss of \$951 for each farm adjacent to the Edgcombe farm. The difference between Edgeworth, the lowest, and Culpepper's Improved, the highest, was 88.48 pounds per acre on the Red Springs farm, which difference would result in a loss of \$531 on the adjacent farms. The difference between Russell's Big Boll, the lowest, and Simpkins's Improved, the highest, was 119.69 pounds per acre on the Iredell farm. This difference would amount to a loss of \$695 to the man who planted Russell's Big Boll on farms adjacent to the Iredell farm. Of course these examples are extreme because no variety is planted exclusively. Yet if a farmer, by knowing the adaptations of a variety, can save from \$500 to \$1,000 on a fifty-acre farm, a study of varieties and their adaptation to different sections and different soils and fertilization is of very great importance.

## VARIATIONS IN PER CENT OF LINT.

Continuing a study of the same varieties as were used in the study of variations in yields it will be seen that there is also a variation in per cent of lint, both on the same soil and on different soils. This can be shown best by following the same methods as were used in showing differences in yields, namely, tables.

	1903	1904	1905	1906	1907	1908	1909	Aver.
Russell's Big Boll:								
Edgecombe Farm.....	32.39	34.39	31.75	32.56	31.23	31.95	24.90	31.31
Red Springs Farm.....	34.38	32.81	35.70					34.27
Iredell Farm.....		35.05	34.98				34.10	34.71
Culpepper's Improved:								
Edgecombe Farm.....	31.62	35.83	33.07	35.26	31.08	33.80	36.60	33.89
Red Springs Farm.....	37.50	37.50	37.39					37.19
Iredell Farm.....		34.45	34.98	34.42	35.37		34.60	34.75
King's Improved:								
Edgecombe Farm.....	36.60	39.20	38.21		35.08	37.40	35.70	37.03
Red Springs Farm.....	39.05	40.62	39.61					39.76
Iredell Farm.....		37.84	37.10	39.19	36.52	37.92	37.50	37.68
Excelsior Prolific:								
Edgecombe Farm.....		36.56	35.42	40.93		36.21	41.20	38.06
Red Springs Farm.....	37.50	40.62	39.61					39.21
Iredell Farm.....		35.45	37.58	39.49		37.09	38.00	37.52
Edgeworth:								
Edgecombe Farm.....		35.37	33.33	33.99	32.10	32.81	34.40	33.66
Red Springs Farm.....		35.94	37.15					36.54
Iredell Farm.....		36.58	35.34	35.21	34.88	37.21	35.20	35.73
Cook's Improved:								
Edgecombe Farm.....			37.09	39.03	39.09	38.61	40.20	38.80
Red Springs Farm.....			40.89					40.89
Iredell Farm.....			40.87	37.61		39.71	38.90	39.27
Simpkins' Improved:								
Edgecombe Farm.....					35.99	36.68	39.30	37.32
Red Springs Farm.....	*							
Iredell Farm.....						37.61	37.70	37.65

\*Farm discontinued.

By looking over the column of averages it will be seen that without exception the average per cent of lint for all the varieties was higher on the Iredell farm than on the Edgecombe farm. It will also be noticed that with only one exception the percentage was higher on the Red Springs farm than on either of the others. True, the Red Springs tests were only continued three years. The Edgecombe farm, by reason of its rich soil, its long season and other natural advantages is the nearest ideal for cotton production of the three farms, Iredell farm, because of its short season, heavy soil, cool springs, is the poorest farm for cotton production of the three. Then why this decided difference in per cent of lint in favor of the Iredell farm? It is known that lint consists largely of carbon and that carbon comes through the leaves of the plant. Cotton on the Edgecombe farm suffers greatly from leaf rust, sometimes almost stripped of leaves; on the Iredell farm leaf rust is almost unknown. The natural supposition would be that the cutting off of the leaf area and consequently the amount of carbon in the plant limits the percentage of lint. There has been no investigation along this line, so this is a mere supposition. Yet it would appear that the farmer can well consider the rust resistant properties of his cotton.

A comparison of the lint production and the yield does not seem to show that there is any relation between the per cent of lint and the yield of any one variety on the same soil or on different soils. To illustrate: In 1905 Russell's Big Boll gave a yield of 616.36 pounds of lint per acre on the Edgecombe farm with a percentage of lint of 31.75, while in 1908 it gave a yield of 362.5 pounds per acre with a percentage of 31.95. In 1905 Russell's Big Boll gave a yield of 279.39 pounds per acre on the Iredell farm with a percentage of lint of 34.98. In 1909 it gave a yield of 289.85 pounds of cotton per acre with a percentage of lint of 34.10. By comparing the other varieties in the same way it will be found that they bear out this same fact.

The following table will help to bring out some other contrasts in the variation in per cent of lint of the different varieties under discussion:

	Edgecombe Farm	Year	Red Springs Farm	Year	Iredell Farm	Year
Russell's Big Boll:						
Highest percent.....	34.39	1904	35.70	1905	35.05	1904
Lowest percent.....	24.90	1909	32.81	1904	34.10	1909
Difference.....	9.49		2.89		.95	
Culpepper's Improved:						
Highest percent.....	34.60	1909	37.50	1904	35.31	1907
Lowest percent.....	31.08	1907	37.39	1905	34.42	1906
Difference.....	5.52		.11		.95	
King's Improved:						
Highest percent.....	39.20	1904	40.62	1904	39.19	1906
Lowest percent.....	35.08	1907	39.05	1903	36.52	1907
Difference.....	4.12		1.57		2.67	
Excelsior Prolific:						
Highest percent.....	41.20	1909	40.62	1904	39.49	1906
Lowest.....	35.42	1905	37.50	1903	35.45	1904
Difference.....	5.78		3.12		4.04	
Edgeworth:						
Highest percent.....	35.37	1904	37.15	1905	37.21	1908
Lowest percent.....	32.10	1907	35.94	1904	35.20	1909
Difference.....	3.27		1.21		2.01	
Cook's Improved:						
Highest percent.....	40.20	1909	40.89	1905	40.87	1905
Lowest percent.....	37.09	1905	*		37.61	1906
Difference.....						
Simpkins' Prolific:						
Highest percent.....	39.30	1909	†		37.70	1909
Lowest.....	35.99	1907			37.61	1908
Difference.....	3.31				.09	

\*One year. †Farm discontinued.

This table brings out the fact that with the same variety there is a greater variation in the per cent of lint on the Edgecombe farm than on either of the others. The most striking difference is with Russell's Big Boll and Culpepper's Improved. Just why this should be is unknown as no records were kept of the growth of these varieties on the different farms. This table again emphasizes the fact that a variety that does best on one soil or in one locality will not always do best on a soil of different character or in another locality.

## GENERAL CONCLUSIONS.

1. That there is a rather wide variation in yields of varieties of cotton on the same soil and on different soils.

2. That this variation regulates the profit or loss of a cotton crop more than most farmers realize.

3. That this variation can be regulated to a large extent by the farmer himself if he will study the adaptation of a variety to his own farm conditions, both as to soil and climate.

4. That, from the knowledge at hand, the variations of one variety on any particular soil can be regulated by a careful and systematic field selection of seed, and only by this method.

5. That, under present conditions, it is of far more importance to the farmer for him to study his field conditions, his variety of cotton and seed selection, etc., than it is for him to try to regulate the market price of cotton. He has been, is, and will be primarily a producer, and not a regulator of market prices. When he better understands the economic production of cotton under his conditions he can better undertake the regulation of markets.

6. That until the best variety of cotton for a particular farm or locality has been established, and the variations of this variety eliminated as far as possible, there need not be very much emphasis laid on the per cent of lint that a variety produces.

7. That after the best variety has been established and the controllable variations eliminated it will be well for the increase of the lint to be considered. But I believe that this will automatically increase and establish itself as the other changes are brought about.

8. That there is no variety that can be called the best variety universally.

9. That there is no variety that can be called the best variety for any particular soil or locality.

10. That the establishing of varieties for any particular type of soil, climate or locality is a great work that can be helped materially by the Experiment Stations but must be worked out finally by each individual farmer for his individual conditions.

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### Feeding Hogs in North Carolina.

BY DAN T. GRAY, CHIEF IN ANIMAL INDUSTRY.

The Southern people are large meat consumers but small meat producers. In fact, the South consumes more meat per capita than any other section of our country, but a large proportion of this meat is shipped into the South from other sections of the country. This is a very strange condition of affairs when all persons who have studied the question agree that pork can be made as cheaply, and perhaps more cheaply, in the South than in any other section of America.

There are many reasons why North Carolina farmers should introduce this line of animal production into their farming system. In the first place, very little capital is required to make a reasonable start: one hundred dollars invested in hogs represents a rather large beginning, but the same amount of money invested in some of the larger animals would be almost no start at all. In the second place, the sow is a rapid producer; each sow will produce no less than twelve pigs a year if she is given proper care and attention; this means that the money invested in hogs works rapidly. In the third place, the returns begin to come back within a very short time—which is an exceedingly important point for the man with limited capital. In the fourth place, the hog can not be surpassed for its ability to build up the soils rapidly, especially when leguminous crops are grown to supply the pasture.

## CORN WHEN FED ALONE IS NOT SATISFACTORY.

The majority of our farmers feed too much corn. It is generally considered that there is no other feed equal to corn for pork production. This is true, provided the corn is used judiciously. But if it be fed alone for any length of time there are few feeds which are poorer. If, however, corn is fed in combination with other feeds, its use is to be highly commended, and it can be used to great economical advantage, too, even though it sells upon the market as high as \$1 a bushel.

The hog is not adapted to living on corn alone, and when we require it of him we are forcing him to do a thing which is not consistent with his nature. Man likes a mixture of feeds or a change in diet; so do the lower animals. The hog in its wild state is omnivorous, feeding upon roots, nuts, fish, grass, snakes, etc.; in fact, but few feeds can be mentioned that he will not eat if he be given the opportunity. Our domesticated hogs have inherited the tendency to select their feed from a variety of substances, and when we enclose them in a pen and give them but one feed we can feel assured that we are not allowing them to reach their highest possibilities.

Experimental data, as well as the experience of our best farmers, show that pork can not be profitably raised and finished upon corn alone when corn sells for 70 cents a bushel. The man who tries to finish hogs on corn alone is following a losing business. There are plenty experiments to show that when corn is worth 90 cents a bushel the cost of each pound of gain will be just about 9 cents; when corn is selling at 80 cents a bushel each pound of gain put on will cost 8 cents; when corn is worth 70 cents a bushel each pound of gain will cost 7 cents; and when corn is worth only 60 cents a bushel pork can be finished for only 6 cents a pound. It appears, therefore, that when 90-cent corn is fed to 7-cent hogs the feeder is losing 20 cents a bushel on his corn. Eight-cent pork must go along with 80-cent corn if the owner is to strike even on feeding corn alone. As a general thing the farmers do not get 8 cents for their hogs. If corn were worth but 40 cents a bushel, as it often is in some of the Western States, it would be a very profitable thing to raise corn and feed it to 6 and 7-cent hogs; good money could be made out of it, as the farmer would then be selling his 40-cent corn, by means of hogs, at 60 and 70 cents a bushel. But even in the corn-belt States it is more profitable to supplement the corn with other concentrates or green crops, and this practice is followed by the best farmers.

## CONCENTRATES TO SUPPLEMENT CORN.

Fortunately for the South, it is not necessary to depend upon corn alone, as almost all the crops which can be grown in any part of the country can be grown in the South, and there are many crops suitable for hog feed which can be grown in no other section of the country. This section is wonderfully blessed in its great variety of grain and concentrates, and, in addition, green and pasture crops can be made to spread over twelve months of the year. In fact, with the use of pasture crops the South is in a position to make pork cheaper than any other section of the United States.

As stated before, the hog likes a variety of feeds and thrives better upon a ration made up of two or more feeds than upon one made up of but one. It has been proved by several of the experiment stations that wheat and corn, when fed separately to fattening hogs, are practically equal in feeding value. At the Wisconsin Experiment Station several tests were made to learn the relative value of wheat and a mixture of wheat and corn in equal parts. It was found that 500 pounds of wheat were required to make 100 pounds of gain, but when wheat and corn were fed in equal parts only 485 pounds of the mixture were required to make the same gain. When fed separately, these grains are of equal feeding value, but the mixture of the two was more valuable than either grain when fed alone. While the South has not the wheat, yet the Wisconsin experiments teach the lesson that if the most is to be realized upon the hog and the corn a supplementary feed must go along with the corn.

Among the high-priced concentrated feeds that may be used along with corn and cheapen the ration are skim milk, wheat shorts, and tankage; these three are popular in the South, and are probably the cheapest and best. While the writer was at the Alabama Agricultural Experiment Station, he used all three of these feeds along with corn. The following table illustrates some of the average results:

TABLE 1—FEEDS TO USE WITH CORN.

Experiment	Ration	Average Initial Weight Each Pig	Average Daily Gain Each Pig	Feed to Make 100 Pounds of Gain	Cost to Make 100 Pounds of Gain
1	Corn alone.....	65 lbs.	.39 lbs.	764 corn	\$9.55
	Corn 2/3.....			339 corn	
	Shorts 1/3.....	60	.83	169 shorts	7.28
	Corn, 1 part.....			296 corn	
	Skim milk, 2 1/5 parts.....	60	1.33	666 skim milk	6.36
2	Corn alone.....	45	.12	874 corn	10.93
	Corn, 8/10.....			293 corn	
	Tankage, 2/10.....	45	.84	73 tank.	5.12
	Corn, 9/10.....			475 corn	
	Tankage, 1/10.....	45	.51	53 tank.	7.00

In the above financial estimate, corn is valued at 70 cents a bushel, wheat shorts at \$36 a ton, skim milk at 40 cents a hundredweight, and tankage at \$40 a ton.

In a general statement it may be said that it always paid to supplement the corn with wheat shorts, skim milk, and tankage, the skim milk proving to be the best and cheapest. Throughout all of the above tests the hogs which were fed on corn alone made exceedingly unsatisfactory gains, gaining in one case as low as one-tenth of a pound daily; larger hogs, however, would have done better. The hogs which were fed on one of the supplements along with the corn made satisfactory gains, those which drank skim milk giving almost remarkable results when compared with the results obtained when corn alone was employed.

It should also be noted that the gains were very expensive when corn was fed by itself, in one case going as high as \$10.93 for each hundred pounds of pork made. In the second case above the expense of fattening the hogs was more than cut in half when one-fifth of the ration was made of tankage. In the first test the wheat shorts and the skim milk both saved much corn and cheapened the ration.

#### PASTURE CROPS TO SUPPLEMENT CORN.

The facts so far presented show one thing clearly—when corn is used alone as a hog feed money is almost sure to be lost. It has also been shown that the feeding value of corn is increased as a result of the use of almost any supplement. But even when corn is assisted by the supplementary feeds mentioned, there are but few cases where 70 cents is realized for a bushel of corn; that is, when hogs sell for six to seven cents a pound live weight. Under present conditions the Southern farmer must see his way clear to realize at least 70 cents a bushel upon his corn when fed to hogs before he can look upon the hog business as a profitable one. In short, concentrated feeds of all kinds are upon such a high level of prices that the farmer can

not afford to limit the feed of the hog to them alone. Help must be sought outside the concentrated feeds.

The supplementary feeds heretofore mentioned, together with several others, are all good and should be used in hog-feeding operations; but the future of profitable hog production in the South depends upon the use of green or pasture crops. It is possible for the Southern farmer to have grazing crops practically the year through, and many of the best farmers have them. The Southern farmer has, in fact, a decided advantage over the Northern farmer in this respect. We have seen that a variety of feeds almost always produced more satisfactory results than one feed. Pastures and green crops can be used to furnish variety better than any other feeds. The Southern farmer has grown so accustomed to placing his hogs in a small pen when fattening period arrives that he has almost forgotten that the hog can make valuable use of many green crops if he be given the opportunity.

#### PERMANENT PASTURES.

Until the farmer sees his way clear to make a permanent pasture or has one already made, he should keep out of the live-stock business. It is, in fact, almost impossible to realize a profit upon any kind of stock without good pastures. Therefore, the first thing to be done when one contemplates engaging in stock raising is to establish a pasture.

The South, which is the very section where they can be made easily, is sadly deficient in pastures. No attention has been given to them; it has all been given to cotton. But the Southern farmer, if he will devote some time and effort to the subject, can have as good a pasture as was ever seen in Kentucky or Missouri, and have that pasture available for grazing more months in the year than is possible in those States. For a permanent pasture there is no combination, either in the North or in the South, that will equal burr clover and Bermuda grass. In many sections the Bermuda can be grazed throughout the summer months and the burr clover from January until the Bermuda comes on again. The combination will afford grazing at least ten months of the year. Both plants are permanent after they are once established. To supplement the permanent pasture, temporary pastures should be grown, as cowpeas, peanuts, etc., but no farmer who has stock can afford to be without this permanent pasture combination to be ready for use when the temporary pastures can not be employed.

#### RAPE PASTURE.

One of the valuable green crops for hogs is rape. It can be sown in the fall after the summer crops are taken off the land, and within seventy days is ready for the hogs to be turned upon it. It is a winter growing crop, or one that can be used between the two summer crops. As a result of its use the land can be kept in use and covered with green vegetation the year round. Several experiment stations and farmers have demonstrated its value as a hog feed.

TABLE 2—RAPE AS A WINTER CROP FOR HOGS.

Lot	Ration	Average Daily Gain	Feed to Make 100 Pounds Pork	Cost to Make 100 Lbs. of Pork		Value 1 Acre Rape in Terms of Corn and Shorts
				Grain	Grain and Pasture	
1	Corn, 2/3.....	.84	320 corn			
	Shorts, 1/3.....		160 shorts	\$6.88	\$6.88	
2	Corn, 2/3.....		172 corn			
	Shorts, 1/3.....		86 shorts			
	Rape pasture.....	.74	.15 acre	3.70	4.90	\$21.20
3	Corn, 2/3.....		110 corn			
	Shorts, 1/3.....		55 shorts			
	Rape pasture.....	.54	.22 acre	2.37	4.13	20.49

In the above financial estimate corn is valued at 70 cents a bushel, shorts at \$36 a ton, and rape pasture at \$8 an acre.

The work was done in Alabama, but the results are entirely applicable to North Carolina, especially the coastal region. This rape crop was sowed after soy beans, on September 21, on a sandy soil. The seed came up well and the hogs were turned on to the pasture November 9 and kept there until April 7, when they were taken off and sold. Five 100-pound pigs were grazed on each acre.

The test shows rape to be an exceedingly valuable winter crop; it saves much corn and other high-priced grains. In fact (see last column above) each acre saved sufficient grain to be worth \$21.20 in one case, \$20.49 in the other case, while the acre of rape did not cost over six dollars. In the lots where the rape pastures were employed, the cost of making gains in weight was very materially smaller than in the lot where dry feeds alone were fed. It cost \$6.88 to make 100 pounds of increase in live weight in Lot 1, where corn and shorts were fed alone. In lots 2 and 3, where rape pastures were grazed, the grain cost to make equal gains was reduced to \$3.70 and \$2.37, respectively. When the expense of planting and cultivating the pastures is also added to the cost of the pork (see column 6), the total cost of making 100 pounds of increase in live weight in Lots 2 and 3 was raised to \$4.90 and \$4.13; the hogs in Lots 2 and 3, therefore, were fattened at an entirely satisfactory profit, while the ones which were finished on corn and shorts in a dry lot, were fattened at a loss, or at least, at an unsatisfactory profit. Rape provides an excellent winter pasture, but other pastures may be used with just about as satisfactory results. Rye, oats, barley, or burr clover may be used to very great advantage.

#### PLANTS FOR SUMMER PASTURE.

The pigs which are born in late winter and early spring should be finished for the market, or for home killing, the following fall or early winter. It will seldom pay to keep them through the first winter. When the pig is sucking the mother, both should be given the run of a pasture crop in order that grain may be saved. If the pig is born in late winter, any of the crops heretofore mentioned can be used until the summer crops begin to come on. When green crops and pastures are thus used, the pig can be gotten up to weaning time as cheaply, perhaps more cheaply, than he can be carried from weaning time to a finish. When the pigs are from 60 to 75 pounds in weight they are ready to begin to finish, and this is the time that the summer pasture crops should be ready to use. This date will be from August to September.

Any reasonably good farmer should experience no difficulty in providing summer and fall pasture crops, as he may take his choice from among cowpeas, peanuts, soy beans, rape, etc.

Many farmers and stations have found cowpeas to be an excellent crop for hogs, although no one claims that they afford as much grazing to the acre as do peanuts and soy beans. At the Mississippi station cowpea pasture was grazed without grain. In 1903, although the crop was grown on thin land, one acre of cowpeas produced 350 pounds of pork. In 1904 the crop was grown on good valley land and produced 483 pounds of pork to the acre. The hogs were turned on the crop when the peas were ripe. Better results would no doubt have been secured if the animals had been given the run of the field about two weeks before the maturity of the peas.

In 1906 the Mississippi substation turned 8 sows with their 30 pigs into a red clover pasture of  $3\frac{1}{2}$  acres on March 20, the red clover having been sown the previous fall. This furnished ample grazing until August 20, when they were turned into a  $4\frac{1}{2}$ -acre lot of corn and peas. The 30 pigs were killed out of this pasture November 1 without the addition of any other feed and dressed 117 pounds each, at an average age of 196 days. The pigs ate approximately 6 bushels of corn each. When land rent is estimated at \$5 an acre, corn at 70 cents a bushel, and the cost of seeding the red clover is also taken into account, each pig cost \$4.98.

It is getting to be a common practice in the Middle States, where cowpeas thrive well, to plant the peas in the corn at the last cultivation and graze the hogs on both crops. This method saves a great amount of labor, and the waste of corn is very small indeed if small pigs are given the run of the field after the fattening animals are taken off; in fact, the loss of corn is not as great as is usually the case when hired help gathers it.

Probably soy beans and peanuts afford the very best obtainable summer, fall, and early winter grazing crops. This, at least, has been the writer's experience. These two crops may be planted in the early part of the summer and be ready for grazing from 80 to 100 days after planting; this, however, depends upon the variety of seed used, the character of soil, etc. Anyway, if they are planted upon the same date the soy beans should be grazed first and the peanuts immediately afterward.

The following tests show how valuable these two crops are:

TABLE 3—PEANUTS AND SOY BEANS AS PASTURES FOR HOGS.

Experiment	Ration	Average Daily Gains	Feed to Make 100 Pounds of Pork	Cost to Make 100 Lbs. of Pork		Value 1 Acre in Terms of Corn Saved
				Corn	Corn and Pasture	
1	Corn alone.....	.38	609 corn	\$7.61	\$7.61	-----
	Corn, 1/4.....		68 corn			
	Soy bean pasture.....	1.1	.22 acres	0.85	2.59	44 bu.
	Corn, 1/2.....		138 corn			
	Soy bean pasture.....	1.0	.2 acre	1.73	3.36	41 bu.
	Corn, 3/4.....		175 corn			
2 $\frac{1}{4}$	Soy bean pasture.....	1.3	.12 acre	2.19	3.17	63 bu.
	Corn alone.....	.33	776 corn	9.58	9.58	-----
	Corn, 1/2.....		134 corn			
	Peanut pasture.....	1.25	.13 acre	1.68	3.08	65 bu.
	Corn, 4/5 } 1/2.....		111 corn			
	Tank., 1/5 }		28 tank.	1.95	2.96	34 bu.
	Peanut pasture.....	1.42	.13 acre			476 lb. tank.
	Peanut pasture.....	1.00	.22 acre		1.76	62 bu.

In the above financial estimates corn was valued at 70 cents a bushel, the pastures at \$8 an acre, and the tankage at \$40 a ton. In some places peanuts should be valued at a very much higher figure than the one used here; if so, the reader can easily make the necessary changes.

These two pastures were both used to very great advantage, and pork was made at a very low cost when compared with the expense when corn was used by itself. When corn was used alone, it cost over 7½ cents to make each pound of pork; when soy-bean pastures were employed the expense was cut down to \$2.59, \$3.36, and \$3.17 to make each 100 pounds of pork in Lots 2, 3, and 4, respectively. When peanut pasture was grazed it cost from \$1.76 to \$3.08 to make 100 pounds of pork when the pasture was valued at \$8 an acre. The hogs were profitably fattened even when the peanuts are valued at \$24 an acre.

#### FINISHING HOGS AFTER PASTURE CROPS ARE EXHAUSTED.

The majority of the farmers of the South who make use of green crops for fattening hogs, dispose of the animals when the crops are exhausted, without finishing them upon grain for a short period in a dry lot. There is a time when the hog should be penned up in a lot and fed grain alone, but that time is not at the beginning of the feeding operations. He should be penned up after the pasture crops are gone and fed grain alone for a few days before slaughtering or marketing. There are several reasons for following this plan. First, the hog, after coming off the pasture, is in just the proper condition to make gains economically and rapidly for a short time. He is in excellent health, active, and, as a rule, his frame is not covered with as much fat as it should carry. The pasture has tended to develop his frame at the expense of fat, especially if he is a young animal. After he is fed in a pen twenty-five to twenty-eight days, he looks better, and is better, than when he came off the pasture, and is actually worth more to the consumer or butcher, as he is fatter and will dress out a higher percentage of good marketable meat than if he had been sold directly from the pasture. Second, when hogs have been grazed upon peanuts, soy beans, and certain other green crops, the meat and lard have become soft, which makes the animal objectionable to the butcher as well as for home consumption. This soft meat can be hardened very materially if the hogs are fed upon grain for only a short period after the crops are exhausted.

What shall the animal be fed during this short dry-lot finishing period? Corn is good; corn in combination with cotton-seed meal is better and is cheaper than corn alone, as the addition of cotton-seed meal to the ration renders the meat hard more rapidly than when corn alone is used. If the animals are to be fed not more than twenty-one days in this finishing period, one-third of the total ration may be made up of cottonseed meal. If it is likely that the last period will be extended over more than twenty-one days, the proportion of cottonseed meal should be cut down to one-fifth or one-sixth of the whole ration, and the finishing period extended not beyond five weeks in all.

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#### A Remedy for Cottonseed Meal Poisoning.

BY W. A. WITHERS.

I presume that it will not be necessary in the presence of so many good, practical farmers to devote much time to the discussion of the danger which accompanies the feeding of cottonseed meal to swine in large amounts, and for very long periods.

Many of you no doubt know from sad experience that sometimes a fine porker fed upon cottonseed meal has been found dead in the morning which appeared perfectly well the previous evening. Sometimes this unfortunate ending may be anticipated from the refusal of the animal to consume the feed. On the other hand, some pigs seem to be highly immune and can eat the meal for long periods and without harmful effects, apparently.

The symptoms of cottonseed meal poisoning which generally have been observed may be briefly stated as follows: When the pig begins to refuse cottonseed meal, he usually shows very rapid, short, shallow breathing, an anæmic condition which shows in the paleness of the mouth, skin and elsewhere, imperfect vision, and even blindness, and a weakening of the muscles of the legs. If the pig is exercised very violently, death usually ensues quickly. A post-mortem examination always shows an oedematous condition of the lungs, and sometimes there is inflammation of the digestive tract.

Many investigators in America and abroad have studied the problem with a view to ascertaining the cause of toxicity and means for overcoming it. The various theories which have been advanced as to what the poisonous substance is, have all been discarded. Lest you throw aside as erroneous the explanation and remedy which we have to offer, I shall endeavor, without going too much into the technical side, to give you an outline of the steps involved in our work, so that you may know the facts which we observed and draw your own conclusions from them.

These experiments were conducted jointly by the Chemical, Veterinary, and Animal Husbandry Divisions of the Agricultural Experiment Station. As Belgian hares, or rabbits, are killed by cottonseed meal in about two weeks, our preliminary experiments were conducted with them instead of with swine, as it takes about twelve weeks to kill the latter. There is also a saving in expense by using the hares.

A feed may be deleterious or harmful to an animal from several causes: (1) from purely mechanical action such as stopping the intestines, lacerating them, etc.; (2) by not having in it the constituents which are necessary for maintaining the life of the animal; or (3) by having in it some true poison, that is some substance which may be taken into circulation in the blood of the animal and thereby interfere with the physiological processes of the body. We may quickly dismiss the idea of injury in a mechanical way, as there has not been an indication of stoppage of the intestines or of irritation by mechanical means. The remedy for an incomplete or improperly balanced feed would be to increase the missing constituent, and the remedy for a poison would be to remove it before feeding or to change it into an insoluble form so that it would be inert in the body of the animal.

Coming back to the symptoms exhibited by the animals fed on the cottonseed meal, we find that they compared fairly well with those exhibited by animals that have had some soluble sulphide added to their feed. These produce death by acting upon the blood, and diminishing its power of carrying oxygen until death ensues. Some soluble iron salt naturally suggests itself as an antidote. In our experiments with rabbits, we fed one gram of cottonseed meal daily for each 100 grams of live weight. This corresponds to one pound daily for each 100 pounds of live weight of swine, or 10 pounds daily for each 1,000 pounds of live weight of beef or dairy cattle. This will be recognized as rather heavy feeding. The meal was mixed with molasses to make it more palatable. Green feed was given one each day in the form of cowpea vines or cabbages. The rabbits were confined in galvanized iron cages, so as to keep them under close observation.

We began feeding five rabbits with the cottonseed meal. At the end of 14 days, two had died, one was sick, and all had lost in weight. At that time we began adding a solution of citrate of iron and ammonia to the feed. The sick rabbit recovered and all three rabbits gained in weight for the next 14 days, at which time the experiment was discontinued. We took another rabbit which had only eaten 75 grams of cottonseed meal during five weeks and added iron solution to his feed. This rabbit at once began to eat the meal, and after the first week continued to eat all the meal supplied him and gained in weight for five weeks, at which time the experiment was stopped. These four rabbits testify that an iron salt will make them well after they have been made sick by cottonseed meal.

We took 22 rabbits and fed them with cottonseed meal at the rate referred to, and all died after an average of 13 days, some of them going as early as

the sixth day and only one enduring so long as 22 days. These 22 rabbits show that cottonseed meal is poisonous.

We began feeding 8 rabbits the same amount of cottonseed meal with all the conditions the same as above, except that an iron salt was added to the feed. We fed 3 of them 64 days, 3 of them 91 days, and 2 of them 106 days, and discontinued the experiment. Each of them remained normal during the whole period, and each ate all the cottonseed meal given. The iron salt enabled them to withstand any deleterious effects of the cottonseed meal, from three to five times as long as the hardest rabbit could endure the meal without the iron salt. Clearly these 8 rabbits testify to the fact that iron salt kept the meal from making them sick.

We took 3 rabbits that had eaten all the meal given to them for 64 days when an iron salt was mixed with it, and had remained normal during the whole period. At that time we ceased adding the iron salt to their feed. After a few days some of them began to refuse some of their feed, and all of them died in 23 days. Here 3 rabbits testify that an iron salt will make cottonseed meal harmless, and if taken from the feed the meal begins to show its harmfulness.

To sum up these experiments, 27 rabbits show the poisonous effects of cottonseed meal and 12 show the efficiency of an iron salt in preventing or overcoming its poisonous properties, and in each case the conclusion was clear and unmistakable.

Of course the practical herdsman is not interested in what may happen to rabbits, if the results apply to them alone. The question is, what about swine, or cattle, or sheep? We have not yet been able to undertake to test the efficiency of the iron as an antidote to cottonseed meal if fed to cattle or horses, but we have made some tests with swine. Twelve pigs weighing an average of 50 pounds each were taken and placed in two separate lots, each in a pen to himself. We began feeding to each daily one-half pound of cottonseed meal and  $1\frac{1}{2}$  pounds of corn meal. To one-half of the animals we gave in addition a solution of an iron salt. The feed was increased as the animals grew. No green feed was given, and the animal got only such exercise as was possible in a small pen. These conditions are not the best, of course, but we wished to make a severe test. On today,\* which is thirteen weeks from the beginning of the experiment, four out of the six pigs receiving the cottonseed meal without an iron salt are dead. The other two have made an average gain of only 35 pounds and do not have a very thrifty appearance. On the other hand, the six pigs which received an iron salt with the cottonseed meal have gained an average of 54 pounds, or nearly half as much again as the straight cottonseed meal pigs. The pigs receiving the iron salt are in the best of condition.

Based upon these results, iron salt appears to be of value in diminishing, if not entirely preventing, the harmful effects to swine of cottonseed meal feeding, provided that feeding is not in excess of the rate of one pound of meal daily to each 100 pounds of live weight. It may be of value if the feeding is in larger amounts, but we prefer to confine our statements to the experiments already performed by us. Should an animal refuse his feed, if given cottonseed meal and an iron salt, I would suggest that the cottonseed meal be withheld from the feed for a few days, until the appetite of the animal returns, and then the meal feeding may be resumed. I should continue the feeding of the iron salt.

I have purposely withheld until the last, directions as to preparing and feeding the iron solution. The directions are so simple that one may easily remember them. Dissolve one pound of copperas (ferrous sulphate) in a barrel (about fifty gallons) of water. For each pound of cottonseed meal take one gallon of the solution, mix thoroughly daily for each 100-pound pig.

\*On October 29, 1913, which is twenty-two weeks after the beginning of this experiment, five of the six pigs consuming cottonseed meal without copperas are dead, but all six of the pigs receiving copperas with the cottonseed meal are alive, gaining in weight, and apparently without any ill effects from the cottonseed meal.

If the pig weighs only 50 pounds, use half the amount of cottonseed meal and one-half of the copperas solution.

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### Reorganizing the Farm.

J. M. JOHNSON.

A system of management which will give greater returns for labor and capital invested in farming in the Piedmont section of the South is needed. It is the western half of North Carolina in which this paper takes greatest interest. It is the agriculture in the section extending westward from the main line of the Seaboard Air Line Railway that shall be considered. In this section, according to the figures given in the 1910 census, the average farm grew crops annually to the value of \$457.00. A study of farm soils, farm equipment, including implements and work stock, and of methods and practices in tillage, convinces one that the yields and values of the crops grown should be much higher than those represented in the census report. When the facts that one-third of the land classified as improved farm land is doing absolutely nothing in the line of growing valuable crops, and that only about one-fifth of the area under tillage gives annual harvests worth \$20.00 or more per acre, while the crops on two-fifths are worth only \$12.00 per acre and on two-fifths the crops are worth less than \$8.50 per acre, is considered, the importance of a better system is recognized.

This system should give more acres of the crops of high value and fewer of those of lower. It should not eliminate crops already grown successfully; neither should it depend upon the introduction of new or untried ones. It should contain nothing of a doubtful nature. It should if possible offer opportunity of utilizing 100 per cent of the improved land in crop growing and in many cases perhaps make farming profitable enough to justify the clearing up or reclaiming good lands now in woods and thus make the farms large enough to allow of improved methods of tillage and so forth. The system should allow the average work animal kept on these farms to do more days of profit-bearing work per year than at the present.

In order that such a system of management and reorganization may be suggested it may be well to review conditions and practices as existing in 1909 and as yet practically unmodified throughout the Piedmont area.

For careful study we shall take the four counties, Chatham, Randolph, Davidson and Rowan, constituting the heart of western North Carolina, and having the soil and climatic conditions peculiar to the great stretch of Piedmont country from Virginia southward. The value of crops per farm in these counties is about  $5\frac{1}{2}$  per cent above the average for the Piedmont section of the State. Some farmers are making good profits, while others are losing money and a great many are practically meeting expenses, but returning no profits.

The lessons drawn from this study will be applicable in the western half of North Carolina, and, the writer believes, in the Piedmont section of the southeast.

In Chatham County in 1909 there were 3,646 farms with an average of 33.3 acres of improved land and 70.8 acres of unimproved land per farm: 23.3 acres of the improved land was planted to crops. These crops were worth \$439.00 per farm. Ten acres of improved land per farm was uncultivated. The cultivated land grew crops to the value of \$18.85 per acre. Had the 10 acres of improved land which was not planted been occupied in growing crops of only average value, the income on each farm should have been increased \$188.50, or for the county, \$687,271.00.

On the farms in the county were 5,301 work horses and mules. This is an average of 1.45 head of work stock for each farm, or one work animal for each 16 acres in crops. Had the entire 33.3 acres been planted there would have been one work animal for every 22.9 acres to be cared for.

In Randolph County there were 4,011 farms averaging 36.1 acres of improved and, 71.9 acres of unimproved land per farm. Of the improved land 22.92 acres per farm were planted to crops which produced a cash value of \$396.14 or \$17.23 for each acre planted. There was an average of 13.18 acres of improved land per farm in this county unplanted. Had this produced only average crops the income per farm should have been increased \$227.09 or for the county \$910,858.00.

Randolph County had 6,462 head of work horses and mules, which is equivalent to 1.61 per farm or one for every 14.25 acres planted or for every 22.4 acres of improved land.

Davidson County reports 3,505 farms with an average of 41.9 acres of improved and 52.6 acres of unimproved land. Of the improved land 27.2 acres is planted to crops which yield a value of \$502.17 per farm or \$18.46 per acre cropped. There remains 14.7 acres of improved land, per farm, unplanted. Had this been devoted to crops yielding harvests of only average value per acre the income per farm should have been increased \$269.36, or for the county \$944,106.00.

In Davidson County there are 5,900 work horses and mules. This is 1.68 work animals for each farm or one such animal for every 16.2 acres cropped, or for 24.9 acres of improved land.

Rowan County has 3,241 farms with 44.1 acres of improved land and 45.1 acres of unimproved per farm. Of the improved land 32.9 acres per farm is planted in crops which give a harvest worth \$617.95 or \$18.78 for each acre planted. There remains 11.2 acres of improved land, per farm, unplanted. Had this made crops in value equal to the average of the cropped land, there should have been added to the income of each farm the sum of \$210.33, or for the county this increase should amount to \$681,679.53.

From figures given it seems a system of farming which would allow the utilization of every acre of improved farm land in the counties considered should add to the income of the average farm as follows: Chatham County, \$188.50; Randolph, \$227.09; Davidson, \$269.36, and Rowan, \$210.33, or a sum total of nearly three and a quarter million dollars for the four counties.

Is it possible for the farmers to reorganize their business on a basis to allow of such an increase in income without a corresponding growth in outlay or in operating expense?

In laying the foundation for the answer to this question a further study of present farm organization embracing cropping systems now followed is necessary.

In Chatham County the average farm of 33.3 acres of improved land has 10.38 acres in corn; 3.8 in cotton; 5.04 in wheat; 2.13 in oats; .75 in hay and 1.22 in miscellaneous crops including tobacco. The average acre in cotton is worth \$30.00, while that in corn is worth \$12.00, wheat \$7.00, oats \$6.00, hay \$22.00.

In Randolph County the average farm or 36.1 acres of improved land has 10.33 acres in corn, .44 in cotton, 7.39 in wheat, 1.70 in oats and 1.95 in hay. The average acre in cotton is worth \$25.00; that in corn is worth \$12.00; that in wheat \$9.00; that in oats \$7.00; in hay \$20.00.

In Davidson County the average farm of 41.9 acres of improved land has 9.27 acres in corn; 1.66 in cotton; 8.80 in wheat; 2.01 in oats and 3.88 acres in hay. An acre of cotton is worth \$24.00, while corn is worth \$12.00, wheat \$9.00; oats, \$6.00, and hay, \$25.00.

In Rowan County the average farm of 44.1 acres of improved land has 11.25 acres in corn; 6.1 in cotton; 7.15 in wheat; 3.05 in oats, and 4.17 acres in hay. Cotton is worth \$24.00 per acre; corn \$12.00, wheat \$8.00, oats \$7.00, hay \$24.00.

The four counties under review have 14,403 farms. These farms average 38.6 acres of improved land. The unimproved land in farms averages 60.9 acres per farm. There are 1.65 work animals (horses and mules) per farm. Were the entire 38.6 acres devoted to farm crops, including hay plants, the

average work animal would have 23.4 acres to care for. Under the conditions and practices prevailing in 1909 these farms had only 24.92 acres each devoted to crops. This means that the average work animal cared for 15.1 acres of land. Should the farmers expect more than this from one horse? Can they get more than this amount of productive work from each horse kept? These are points to be considered.

The crop system followed on the average of these farms called for 10.14 acres in corn and 2.87 acres in cotton; by adding .99 of an acre for miscellaneous spring planted crops to the above, there would be 14 acres of land per farm requiring breaking and preparing for spring planting. If this breaking is done with one-horse plows it should require from 16 to 20 days for one horse. All the harrowing given should not require more than four days. Laying off rows and putting down fertilizers should not take more than six days work for one horse. Six days again for bedding and planting brings the horse work on the 14 acres up to 36 days at the time the last seed goes into the ground. The time required to cultivate these crops should not exceed five days for one horse each time they are gone over. If they are worked five times in the course of the spring and summer a maximum of 25 days for a horse will be required after the crops are planted and by the time they are laid by. A liberal allowance at harvest and market time should call for not to exceed 10 days of horse work. Thus in making 14 acres of cultivated crops as grown per farm in 1909 may possibly demand 71 days of work for one horse.

This farm, though, has 7.1 acres in wheat, 2.2 in oats and 2.6 acres in hay; or a fraction less than 12 acres in all these crops. Fall preparation and planting is called for in case of the wheat and better yields may be expected from fall planted oats. These two crops occupy 9.3 acres. Allowing 20 days for one horse on wheat and oats and 9 days on the 2.6 acres in hay, we get a total of 100 days of horse work actually required in taking care of all the crop work on the average of these farms.

The farm has 1.65 work animals to do 100 days work per year. This means that the average work animal (horse or mule) does only 60 days of farm work per year. Is it reasonable to expect more than this from him? Will it pay his owner to exact more days work and more acres cultivated for each horse or mule?

Fortunately we have records on a number of farms in the Piedmont section of North Carolina which throw some light on this point. Let us look to one of these farms. On this farm we find 288 acres of crops grown; corn 100 acres; cotton 75; wheat 50, hay and miscellaneous crops making up the rest. Ten head of work stock taking care of all this, or an average of 28.8 acres for each horse or mule on the place. After every expense, including interest on the investment, is paid, this farm shows a clear profit of \$2,900, or \$290 00 profit for each head of work stock used. Other farms, some much smaller, show proportionately as good results.

It is reasonable to expect more than 60 days work from each horse or mule kept on the farm in the Piedmont section of North Carolina as well as other southern states. It should pay the farmer to exact more days of productive work from the work stock, and thereby make a greater quantity of valuable crops.

The farm should be organized to allow each head of work stock to care for a minimum of 23 acres of land in crops of commercial value. Such a system should call for not less than 100 days work per year from each head of work stock kept. In all probability the farm would be more profitable if 150 days of work at productive enterprises could be exacted from each horse. The South may not be ready for such a system at the present, but her farmers should begin to plan for it and gradually grow to it.

Doubtless it is more difficult to organize a small farm on the better basis than a large one. It is not easy to get more than 75 days of work annually for a horse at profitable enterprises on farms as now organized and grow

from 15 to 16 acres of cultivated crops for each work animal kept. When these farms become organized on a basis calling for two-horse teams, with from 45 to 50 acres in cultivated crops per team, it will be an easy matter to get from 100 to 120 days of profit earning work for each head of work stock. The difficulties standing in the way of such organization are more apparent than real. The average farm now has 23.4 acres of improved land per work animal. The system proposed will require the utilization of all this land. On a great number of farms only one horse is kept at the present. It will be wise for men working such places to exchange teams with one another a few days at the periods of heavy work, especially such as breaking land and harrowing it and also at harvest time. This will give each farm the advantages of a better prepared soil and the more efficient methods of cultivating and harvesting. Where two or more horses are already kept, these should be hitched into the double teams and used with bigger plows and other machinery necessary for good farming.

The organization of a two-horse farm having 50 acres of improved land may be as follows: 12 acres in cotton, 12 in corn and 12 in small grain, using wheat on a part and oats on the remainder, but proportioning the acreage of the respective grains to the needs and demands of the farm. The small grain should be followed by a crop of peas for hay. About 4 acres for all miscellaneous crops, and 10 acres for grass for hay and if there is no other grazing land a part of the grass may be used for pasture. For the one-horse farm the acre to each crop may be reduced proportionately.

The 24 acres for corn and cotton will be to plow after fall crop work is out of the way and before time to plant in the spring. After the land is plowed it should be harrowed, then the rows are to be laid off, fertilizers applied and perhaps in many cases bedded before planting.

A two-horse team with a turn plow will break approximately 1.75 acres in a day. Thus it may require 14 days to break the 24 acres. Another four days will be needed to do the harrowing. Six days with two horses should open all rows and put down the fertilizers. Six days again should do the bedding and planting. Cultivating these crops an average of five times should require not more than 35 days of horse work. Harvesting and housing the corn and cotton will require not more than one day of horse work per acre or 24 days for handling both crops. Allowing 12 days for all extra horse work, we have the 24 acres of corn and cotton made at an expenditure of 131 days horse work.

The horse work required in caring for the 12 acres in small grain followed by peas for hay should not exceed 4 days per acre, or 48 days for the two crops. Allowing 25 days of horse work on the four acres of miscellaneous crops and 20 days on the permanent hay and pasture lands, we have a sum total of 223 days of horse work required on the 50-acre farm organized on the suggested basis. This is 111.5 days work for each horse instead of 60 days as by the system prevailing on the same farms in 1909 and which has not been greatly modified in recent years.

#### IMPORTANCE OF PROPOSED SYSTEM.

Under the system prevailing during the past few years the farmer cultivated 24.92 acres of land with 1.65 head of work stock and grew crops to the value of \$482. Or one horse does the work on 15.1 acres, making crops worth \$277. The average farm has 13.7 acres of improved land doing nothing, while 60.9 acres remain unimproved. The proposed system calls for the utilization of all the improved land in profit producing enterprises. It will also call for bringing under cultivation of from 12 to 15 acres of the most fertile of the unimproved lands and the cultivating of this reclaimed acreage in valuable crops.

Allowing the yields and values per acre of the respective crops to remain in years to come the same as in the past, let us see how the earning of the farm is affected:

Cotton, 12 acres, @ \$26.40.....	\$ 316.80
Corn, 12 acres, @ \$12.00.....	144.00
Small grain—	
10 acres in wheat, @ \$9.00 per acre.....	90.00
2 acres in oats, @ \$6.00 per acre.....	12.00
Pea Hay, 12 acres, @ \$20 per acre.....	240.00
Grass Hay, 10 acres, @ \$23.38 per acre.....	233.80

Total, 46 acres crops value.....\$1,036.60

These figures are based on the supposition that the change in system would not tend to increase yield per acre of any of the crops now grown. This assumption is not entirely correct, as it is well known that a change from one-horse to two-horse farming, especially when accompanied by more liberal use of cow peas and other legumes in the rotation, is followed by increased yields from each and every crop grown. Increased yields with prices remaining stationary means increased income for the farm.

Under the system proposed the corn yields should average double what they are under the present. Cotton should be influenced in a like manner. Small grain yields should be increased from 50 to 100 per cent. Hay should make a very material increase.

After the proposed system has been in operation for a period of five years, the better farms of the two-horse or 50-acre class should show incomes of from \$750 to \$1,000 after all expenses are paid.

To some it may seem that there is too much land devoted to cotton for the amount of labor available at chopping and picking times. If conditions are not favorable to this portion of the land in cotton, it may be reduced without materially affecting the income, provided the right crops are substituted. The average acre of cotton under prevailing conditions is worth \$26.40, while an acre of hay is worth \$23.38. If half the cotton land be planted to hay crops of only average value, the farm income suffers a reduction of \$18.12. The saving in labor and fertilizer would in all probability overbalance the difference in the value of the cotton dropped and the hay added to the cropping system.

Unless the yields of small grain and corn increase very materially, their acreage should not be increased, and it may be advisable to quit growing wheat and oats for grain, but to handle these as cereal hay crops. In either case every acre growing the wheat, oats or other small grain as a hay or grain crop should be planted to peas or other summer growing legumes as soon as possible after grain or cereal hay crops have been harvested. The summer grown crop of peas or other legumes may be harvested for hay, or if soil conditions and the needs of the farm are such as to justify they may be plowed under and thereby increase the yields of other crops in the pasture.

The secret of success lies in keeping all the tillable land busy in growing valuable crops and to have enough tillable land to give the teams profitable employment as many days as possible during the year. The cropping system should be such as to keep the available labor employed on profitable enterprises during as many months in the year as possible.



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## LEAF TOBACCO SALES FOR NOVEMBER, 1913.

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Pounds sold for producers, first hand.....	24,954,002
Pounds sold for dealers .....	1,173,148
Pounds resold for warehouses .....	1,324,539
Total .....	<u>27,451,689</u>

**THE BULLETIN**  
**OF THE**  
**NORTH CAROLINA**  
**DEPARTMENT OF AGRICULTURE**  
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\*Assigned by the Bureau of Soils, United States Department of Agriculture.

†Assigned by the Bureau of Animal Industry, United States Department of Agriculture.

‡In co-operation with Bureau of Plant Industry, United States Department of Agriculture.

## LETTER OF TRANSMITTAL

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MAJOR W. A. GRAHAM,  
*Commissioner of Agriculture.*

DEAR SIR:—I am sending you herewith a manuscript discussing in a brief way the results of the variety test work done with corn on the Test Farms and at different points in the State during the past season. This work has been carried out according to plans made and inaugurated by J. L. Burgess, Agronomist in Cereal Investigations. The tables and other data have been arranged and the report written by G. M. Garren, assistant Agronomist in Cereal Investigations.

I recommend the publication of the manuscript as the February BULLETIN.

Respectfully submitted,

C. B. WILLIAMS,  
*Chief, Division of Agronomy.*



## VARIETY TESTS OF CORN FOR 1913

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BY G. M. GARREN. ASSISTANT IN CEREAL INVESTIGATIONS.

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Herewith is submitted the tables of the results of the annual tests of varieties of corn on the different Test Farms. This year there were six tests made, one each on the Buncombe Farm, the Iredell Farm, the Central Station at Raleigh, the farm of the Tobacco Station at Oxford, the Edgecombe Farm, and on land adjoining the black land farm at Winona. A severe storm September 3d so injured the crop at Winona that the results were lost altogether. Owing to an accident only a few of the varieties at the Oxford Station were saved and only partial data on these were possible. The weights of the cobs from the bushels of shelled corn were lost and this almost ruined the entire results. The yields of bushels of shelled corn per acre, upon which the rating of the varieties are based, were found by dividing the pounds of ears per acre by 70, the standard commercial number of pounds of ears of dry corn required to shell one bushel, instead of the actual number of pounds, found by weighing the corn when harvested, as was used in all the other tables. This gives, therefore, only an approximation instead of actual yields.

The tables in form are the same as those published in previous issues of the Corn Bulletin. They are, therefore, by this time fairly intelligible to all interested readers.

Under given conditions the largest yield of corn depends upon three things: the number of stalks on the land, the number of ears on the stalks, and the size and shape of the ears. By size and shape of ears is meant their shelling capacity, not mere bulk. Any attempt to supply artificially either one of these elements when defective or lacking altogether, destroys field conditions, under which all such tests have to be conducted to be of practical value. The only one of these elements that any reasonable attempt can be made to supply when lacking is that of stand. Perfect stands are almost unknown. Sometimes the stand of one variety is almost perfect; another along side of it very poor. Obviously it is very difficult to make a fair comparison of yields with such unequal stands. An effort has been made in the fourth column under head of "Yields Per Acre" to overcome this difficulty. Here the yields per acre have been calculated on the basis of a perfect stand. It is a mere calculation but gives a fair working idea of the actual differences in yields among the varieties. At the Buncombe Farm the stand was made perfect by supplying the missing stalks from another part of the plat. Obviously this method takes no note of whether the supplied stalks had the average number of ears or whether the ears were the average size. Neither does it take note of the average per cent of barren

stalks. It is less reliable than the calculation methods. Like the latter, it only aids one to get an idea of the real differences in yields of the varieties when the stand is abnormal.

In Table I are recorded the results at the Buncombe Test Farm. The weights of the shelled bushels of corn are very low, far below the standard. The growing season in the mountains this year was unusually short. The frost struck the corn before it fully matured. Hence it is light and chaffy. Boone County, Whitson, Brooks' Pride, Golden Prolific, and White Majestic are the five highest yielders. Boone County and Whitson have the same rank. Whitson has fewer barren stalks and therefore really ranks first. It is a native corn and thoroughly acclimatized.

The results at the Iredell Farm are recorded in Table II. Only 26 varieties were tested and upon the whole it was the most satisfactory test of the whole year. Weekly's Improved, with 36 barren stalks out of a total of 281, ranked first in yield. It had been improved for two years in the grain-breeding work of the Division of Agronomy, and came from Selection No. 35, made in 1910. Being acclimatized and improved by seed selection explains in large part its high yield. Golden Prolific, Southern Beauty, Weekly's Improved (South Carolina grown) and Sanders' Improved make up the five highest yielders in this test.

The results at the Central Station at Raleigh are recorded in Table III. A larger number of varieties than at any of the other stations were tested here. First rank was taken by First Generation of Cross No. 182. This variety, along with several others, was furnished by the Bureau of Plant Industry at Washington. These varieties are designated by number and may be so recognized. This is the second year these varieties have been tested in the State, and the first time any one of them has taken the lead. Biggs' Seven Ear, one of the best prolific corns for Eastern Carolina, takes second place. Cocke's Prolific, another most excellent variety for Eastern Carolina, comes third. Golden Prolific and Marlboro's Prolific (Tennessee grown) make up the five highest yielders.

Table IV contains the results of the test at the Edgecombe Farm. Here the per cent of ears to stover is unusually high. The corn was blown down by the September storm and was not harvested till late in the season. Consequently all the stover was practically destroyed except the bare stalks. This is especially true of the early maturing varieties. Batts' Four Ear (Georgia grown), Weekly's Improved (North Carolina grown), Latham's Double, Weekly's Improved (South Carolina grown), and Parker's Prolific, all prolific varieties, are the five leading varieties in this test.

In Table V are found the results of the test on the farm of the Oxford Tobacco Station. Here Parker's Prolific, Cocke's Prolific, and Biggs' Seven Ear, the three leading prolific varieties of Eastern Carolina, and Hickory King and First Generation of Cross No. 182, two single-eared varieties, make the five highest yielders. But on account of a different and less accurate method of computation as noted above, this table is less reliable than any of the others.

In Tables VI and VII are the compiled results of the tests of seven varieties for five years on the Iredell and Edgecombe Farms. Whenever a variety maintains the lead for five or more years, one is safe in concluding that that variety is well adapted to the locality in which it was grown. Any farmer living in the vicinity of the Iredell and Edgecombe farms can plant a pure acclimatized strain of Weekly's Improved or Biggs' Seven Ear, the leading variety of these respective farms, with a reasonable certainty of obtaining maximum results, so far as variety influences those results.

TABLE 1.—VARIETY TEST OF CORN AT THE BUNCOMBE TEST FARM IN 1913.

Variety	Stalks Per Plat		Yield Per Plat				Yield Per Acre				Total Weight		Shelling Capacity		Rank According to Yield
	For Perfect Stand	By Actual Count	Barren Stalks	Pounds of Stover	Pounds of Ears	Pounds of Stover	Pounds of Ears	Bushels of Shelled Corn	Bushels of Shelled Corn With Perfect Stand	Pounds of Ears to Shell One Bushel	Per Cent. Stover	Per Cent. Ears	Per Cent. Grain	Per Cent. Cob	
Boone County.....	100	100	20	37	50.5	999	1,363.5	23.1	59	42.2	57.8	65.2	34.8	47	1
Whitson.....	100	100	25	57	60	1,539	1,620	23.1	70	48.7	51.3	80.0	20.0	56	1
Brook's Pride.....	100	100	14	60	51	1,620	1,377	22.9	60	54.0	46.0	80.0	20.0	48	2
Golden Prolific.....	100	100	7	39	53.5	1,053	1,444.5	22.5	64	42.1	57.9	81.2	18.8	52	3
White Majestic.....	100	100	6	52	51	1,404	1,377	22.5	61	50.4	49.6	85.2	14.8	52	3
Latham's Double.....	100	100	4	55	47.5	1,485	1,282.5	22.1	58	53.1	46.9	79.3	20.7	46	4
Deaton's Favorite.....	100	100	21	73	50	1,971	1,357	21.9	62	59.3	40.7	80.6	19.4	50	5
Craig's Red Cob Prolific.....	100	100	9	55	53.5	1,485	1,444.5	21.8	66	50.6	49.4	78.7	21.3	52	6
Batts' Four Ear (N. C. Grown)	100	100	20	53	49.5	1,431	1,322.5	21.3	62	51.7	48.3	80.6	19.4	50	7
Selection No. 177.....	100	100	0	40	55	1,080	1,485	21.2	70	42.1	57.9	82.8	17.2	58	8
Simpkins' Prolific.....	100	100	16	45	48.5	1,215	1,309.5	21.1	62	48.0	52.0	80.6	19.4	50	9
Shenandoah White Dent.....	100	100	4	34	49	918	1,328	21.0	63	40.9	59.1	82.5	17.5	52	10
Selection No. 170.....	100	100	26	71	43.5	1,917	1,174.5	20.9	56	62.0	38.0	82.1	17.9	46	11
One Ear Corn.....	100	100	30	65	49	1,755	1,323	20.6	64	57.0	43.0	75.0	25.0	48	12
Columbia Beauty.....	100	100	8	42	49	1,134	1,323	20.6	64	46.1	53.9	81.2	18.8	52	12
Improved Southern Snow Flake.....	100	100	13	48	50	1,206	1,350	20.4	66	48.9	51.1	81.8	18.2	54	13
Cross No. 176.....	100	100	0	52	51.5	1,404	1,390.5	20.4	68	50.2	49.8	82.3	17.7	56	13
Biggs' Seven Ear.....	100	100	5	42	52.5	1,134	1,417.5	20.2	70	44.4	55.6	77.1	22.9	54	14
Cross E-1NE-5.....	100	100	31	71	45.5	1,917	1,228.5	19.8	62	60.9	39.1	77.4	22.6	48	15
Southern Beauty.....	100	100	5	39	45	1,053	1,215	19.5	62	46.4	53.6	83.3	16.7	52	16
Weekley's Improved (N. C. Grown)	100	100	32	49	50.5	1,323	1,363.5	19.4	70	49.2	50.8	77.1	22.9	54	17
Blount's Prolific.....	100	100	13	40	51.5	1,080	1,390.5	19.3	72	43.7	56.3	80.5	19.5	58	18
Eureka.....	100	100	19	66	51	1,782	1,377	19.1	72	56.4	43.6	75.0	25.0	54	19
Weekley's Improved (S. C. Grown)	100	100	16	70	46	1,890	1,242	19.1	65	60.3	39.7	73.8	26.2	48	19
Summerour.....	100	100	0	76	51	2,052	1,377	19.1	72	59.8	40.2	75.0	25.0	54	19

Raleigh Prolific.....	100	100	8	44	49	1,188	1,323	18.9	70	47.3	52.7	77.1	22.9	54	20
Hickory King.....	100	100	2	44	44	1,188	1,188	18.8	63	50.0	50.0	83.1	16.9	53	21
First Gen. Cross No. 182.....	100	100	7	31	46	837	1,242	18.8	66	40.2	59.8	81.8	18.2	54	21
Crook's Prolific.....	100	100	32	52	42.5	1,404	1,147.5	18.5	62	38.0	62.0	74.1	25.9	46	22
Marlboro Prolific (Tenn. Grown).....	100	100	0	47	48.5	1,269	1,309.5	18.1	72	49.2	50.8	75.0	25.0	54	23
Goodman's Prolific.....	100	100	1	46	44.5	1,242	1,201.5	18.1	66	50.8	49.2	81.8	18.2	54	23
Cocke's Prolific.....	100	100	0	42	46.5	1,134	1,255.5	17.9	70	47.4	52.6	77.1	22.9	54	24
Selection No. 187.....	100	100	35	53	50	1,431	1,350	17.7	76	51.4	48.6	76.3	23.7	58	25
Gerrick's Prolific.....	100	100	17	64	45	1,928	1,215	17.3	70	55.0	45.0	74.2	25.8	52	26
Parker's Prolific.....	100	100	13	41	46	1,107	1,242	17.2	72	47.1	52.9	77.7	22.3	56	27
Selection No. 138.....	100	100	39	35	42	945	1,134	16.2	70	45.4	54.6	77.1	22.9	54	28
Battis' Four Ear (Ga. Grown).....	100	100	35	59	39.5	1,593	1,066.5	15.6	68	59.8	40.2	79.4	20.6	54	29
Selection No. 164.....	100	100	2	36	39	972	1,053	15.0	72	48.0	52.0	77.7	22.3	56	30

TABLE II—VARIETY TEST OF CORN AT THE IREDELL TEST FARM IN 1913.

Varieties	Stalks Per Plat		Yield Per Plat		Yield Per Acre						Total Weight		Shelling Capacity		Rank According to Yield	
	For Perfect Stand	By Actual Count	Barren Stalks	Pounds of Stover	Pounds of Ears	Bushels of Shelled Corn			Bushels of Shelled Corn With Perfect Stand	Pounds of Ears to Shell One Bushel	Per Cent. Stover	Per Cent. Grain	Per Cent. Cob	Weight of Measured Bushel of Shelled Corn		
						Pounds of Stover	Pounds of Ears	Bushels of Shelled Corn								
Weekley's Improved (N. C. Grown)	230	281	36	206	203	4,738	4,669	66.7	52.9	70	50.3	49.7	80.0	20.0	56.0	1
Golden Prolific	230	266	13	177	196	4,071	4,508	64.8	55.6	69.5	47.4	52.6	82.7	17.3	57.5	2
Southern Beauty	230	227	6	165	158	3,795	3,634	57.6	58.1	63	51.0	49.0	84.1	15.9	53.0	3
Weekley's Improved (S. C. Grown)	230	231	43	175	165	4,025	3,795	53.4	53.1	71	51.4	48.6	76.0	24.0	54.0	4
Sanders' Improved	230	210	26	151	138	3,473	3,174	51.1	55.8	61.5	52.2	47.8	85.3	14.7	52.5	5
Biggs' Seven Ear	230	211	8	145	170	3,335	3,910	48.8	53.1	80	46.0	54.0	78.7	21.3	63.0	6
Latham's Double	230	190	17	193	138	4,439	3,174	48.0	57.9	66	58.3	41.7	80.5	19.5	54.0	7
Lippard's Selection	230	198	11	153	138	3,519	3,174	48.0	55.6	66	51.2	48.8	84.8	15.2	56.0	8
Cooke's Prolific	230	200	16	123	146	2,829	3,358	47.9	54.9	70	45.7	54.3	80.7	19.3	56.5	9
Columbia Beauty	230	210	10	156	135	3,588	3,105	47.4	51.7	65.5	53.6	46.4	83.9	16.1	55.0	10
Slompkins' Prolific	230	201	5	157	117	3,611	3,381	46.9	53.5	72	51.6	48.4	80.5	19.5	58.0	11
Gerrick's Prolific	230	213	46	211	140	4,853	3,220	46.0	49.4	70	60.1	39.9	77.1	22.9	53.0	12
Marlboro Prolific	230	188	16	139	136	3,197	3,128	42.8	52.1	73	50.5	49.5	80.8	19.2	59.0	13
Parker's Prolific	230	201	9	121	133	2,783	3,059	42.7	48.7	71.5	47.6	52.4	79.7	20.3	57.0	14
Batts' Four Ear	230	216	47	196	130	4,508	2,990	42.7	48.3	70	60.1	39.9	80.1	19.9	57.0	15
Craig's Red Cob Prolific	230	158	10	118	111	2,714	2,553	42.5	54.7	59.5	51.0	49.0	84.8	15.2	50.5	16
Blount's Prolific	230	200	6	129	130	3,067	2,990	40.4	46.4	74	45.9	54.1	82.4	17.6	61.0	17
First Gen. Cross No. 182	230	156	0	113	119	2,599	2,737	40.2	59.1	68	48.7	51.3	80.8	19.2	55.0	18
Summerour	230	191	21	81	118	1,863	2,714	37.4	44.8	72.5	40.7	59.3	80.0	20.0	58.0	19
Hickory King	230	185	10	143	103	3,289	2,369	36.4	45.0	65	58.1	41.9	86.1	13.9	56.0	20
Eureka	230	157	24	143	115	3,289	2,645	35.7	52.2	74	55.4	44.6	78.3	21.7	58.0	21
One Ear Corn	230	131	12	151	98	3,473	2,258	33.7	59.1	67	60.6	39.4	77.6	22.4	52.0	22
Goodman's Prolific	230	143	49	108	95	2,484	2,185	32.6	52.2	67	53.2	46.8	86.7	13.3	58.0	23
Deaton's Favorite	230	145	13	136	92	3,128	2,116	31.5	49.9	67	59.6	40.4	80.5	19.5	54.0	24
Cross E-IXE-5	230	138	22	143	86	3,289	1,978	29.0	48.3	68	62.4	37.6	79.4	20.6	54.0	25
Boone County	230	120	11	74	66	1,702	1,518	23.3	44.6	65	52.8	47.2	83.0	17.0	54.0	26

TABLE III—VARIETY TEST OF CORN AT THE CENTRAL STATION IN 1913.

Varieties	Stalks Per Plat		Yield Per Plat		Yield Per Acre			Total Weight		Shelling Capacity		Rank According to Yield				
	For Perfect Stand	By Actual Count	Barren Stalks	Pounds of Stover	Pounds of Ears	Bushels of Shelled Corn	Bushels of Shelled Corn With Perfect Stand	Pounds of Ears to Shell One Bushel	Per Cent. Stover	Per Cent. Ears	Weight of Measured Corn					
											Per Cent. Grain		Per Cent. Cob			
First Gen. Cross No. 182	134	128	37	61	54	2,440	2,160	34.2	35.8	63	53.0	47.0	78.7	21.5	52	1
Biggs' Seven Ear	134	144	37	82.75	61.25	3,310	2,450	34.0	31.6	72	57.4	42.6	81.9	18.1	59	2
Cooke's Prolific	134	122	23	89.5	59.5	3,580	2,380	33.0	36.2	72	60.0	40.0	81.9	18.1	59	3
Golden Prolific	134	135	27	88.5	56.5	3,540	2,260	32.7	32.4	66	61.0	39.0	81.8	18.2	54	4
Marlboro Prolific (Tenn. Grown)	134	133	30	87	55	3,480	2,200	32.3	32.5	68	61.2	38.8	80.8	19.2	55	5
Simpkins' Prolific	134	131	29	85	54	3,400	2,160	30.4	31.0	71	61.1	38.9	81.6	18.4	58	6
Selection No. 177	134	118	19	74.25	50.75	2,970	2,030	29.8	33.8	68	59.4	40.6	85.2	14.8	58	7
Improved Southern Snow Flake	134	109	12	62.50	50.5	2,500	2,020	28.8	35.4	70	55.3	44.7	82.8	17.2	58	8
Selection No. 120	134	115	35	80.25	45.75	3,210	1,830	28.1	32.7	65	63.6	36.4	83.0	17.0	54	9
Southern Beauty	134	111	28	62.5	45.5	2,500	1,820	28.0	33.8	65	57.4	42.6	83.0	17.0	54	10
Selection No. 164	134	130	33	87.5	50.5	3,500	2,020	27.6	28.4	73	63.4	36.6	82.1	17.9	60	11
Selection No. 138	134	117	25	72.75	48.25	2,910	1,930	27.1	31.0	71	60.1	39.9	78.8	21.2	56	12
Batts' Four Ear (N. C. Grown)	134	142	37	92	48	3,680	1,920	27.0	25.4	71	65.0	35.0	81.6	18.4	58	13
Parker's Prolific	134	122	30	73.5	46.5	2,940	1,860	26.9	29.5	69	61.2	38.8	82.6	17.4	57	14
Hickory King	134	105	1	92	43	3,680	1,720	26.6	39.9	66	68.1	31.9	87.8	12.2	58	15
Eureka	134	117	36	93.5	48.5	3,740	1,940	26.2	30.0	74	65.8	34.2	79.7	20.3	59	16
Raleigh Prolific	134	127	24	86	46	3,440	1,840	29.9	27.3	71	65.1	34.9	81.6	18.4	58	17
Blount's Prolific	134	131	16	79.5	48.5	3,180	1,940	25.5	26.0	76	62.1	37.9	78.9	21.1	60	18
Weekley's Improved (N. C. Grown)	134	122	33	76	46	3,040	1,840	25.5	28.0	72	62.2	37.8	80.5	19.5	58	18
White Majestic	144	127	39	71.25	40.75	2,870	1,630	25.4	26.8	64	63.6	36.4	84.3	15.7	54	19
Crook's Favorite	134	119	47	72.5	43.5	2,900	1,740	25.2	28.3	69	62.5	37.5	79.7	20.3	55	20
Selection No. 181	134	141	46	111	44	4,440	1,760	25.1	23.8	70	71.6	28.4	82.8	17.2	58	21
Farley's Yellow Dent	134	123	33	63.75	46.25	2,550	1,850	25.0	27.2	74	57.9	42.1	78.3	21.7	58	22
Sander's Improved	134	109	36	75	41	3,000	1,640	24.1	29.6	68	64.6	35.4	83.8	16.2	57	23
Latham's Double	134	144	68	86.5	40.5	3,460	1,620	23.8	22.1	68	68.1	31.9	82.3	17.7	56	24

TABLE III. VARIETY TEST OF CORN AT THE CENTRAL STATION IN 1913—Continued.

Varieties	Stalks Per Plat		Yield Per Plat		Yield Per Acre				Total Weight			Shelling Capacity	Weight of Measured Bushel of Shelled Corn	Rank According to Yield		
	For Perfect Stand	By Actual Count	Barren Stalks	Pounds of Stover	Pounds of Ears	Pounds of Shelled Corn	Bushels of Shelled Corn	Bushels of Shelled Corn With Perfect Stand	Pounds to Shell One Bushel	Per Cent. Stover	Per Cent. Ears				Per Cent. Grain	Per Cent. Cob
One Ear Corn.....	134	115	23	75.75	39.25	3,030	1,570	23.4	27.2	67	65.8	34.2	82.0	18.0	55	25
Goodman's Prolific.....	134	105	11	62.5	38.5	2,500	1,540	23.3	29.7	66	61.8	38.2	87.8	12.2	58	26
Cross No. 176.....	134	169	80	104.25	42.75	4,170	1,710	23.1	18.3	74	70.9	29.1	81.0	19.0	60	27
Craig's Red Cob Prolific.....	134	91	23	57	35	2,280	1,400	22.2	32.6	63	61.9	38.1	84.1	15.9	53	28
Brook's Pride.....	134	103	35	74	34	2,960	1,360	21.9	28.4	62	62.7	37.3	85.4	14.6	53	29
Columbia Beauty.....	134	104	26	61	36	2,440	1,430	21.8	28.0	66	65.9	34.1	84.8	15.2	56	30
Chappel.....	134	141	55	103.75	39.25	4,150	1,570	21.8	20.7	72	72.5	27.5	79.1	20.9	57	30
Selection No. 170.....	134	109	37	88.5	36	3,540	1,440	21.8	26.8	66	71.0	29.0	78.7	21.3	52	30
Deaton's Favorite.....	134	93	31	65	33	2,600	1,320	20.0	28.8	66	66.3	33.7	81.8	18.2	54	31
Shenandoah White Dent.....	134	100	30	56.75	34.25	2,270	1,370	19.8	26.5	69	62.3	37.7	81.1	18.9	56	32
Boone County.....	134	92	30	55.25	31.75	2,210	1,270	19.5	28.4	65	63.5	36.5	80.0	20.0	52	33
Batts' Four Ear (Ga. Grown).....	134	142	44	102.5	33.5	4,100	1,340	19.1	18.0	70	75.3	24.7	82.8	17.2	58	34
Gerrick's Prolific.....	134	120	45	99	35	3,960	1,400	18.9	21.1	74	73.8	26.2	77.0	23.0	57	35
Rogers White Dent.....	134	111	17	91	33	3,640	1,320	18.8	22.7	70	73.3	26.7	82.8	17.2	58	36
Summerour.....	134	104	29	76	33	3,040	1,320	18.3	23.5	72	69.7	30.3	81.9	18.1	59	37

TABLE IV.—VARIETY TEST OF CORN AT THE EDGEcombe TEST FARM IN 1913.

Varieties	Stalks Per Plat			Yield Per Plat		Yield Per Acre					Total Weights			Shelling Capacity		Rank According to Yield
	For Perfect Stand	By Actual Count	Barren Stalks	Pounds of Stover	Pounds of Ears	Pounds of Stover	Pounds of Ears	Bushels of Corn		Pounds of Ears Bushel One Bushel With Perfect Stand	Per Cent. Stover	Per Cent. Grain	Per Cent. Cob	Weight of Measured Bushel of Shelled Corn		
								Bushels of Shelled Corn	Bushels of Shelled Corn With Perfect Stand							
Batts' Four Ear (Ga. Grown).....	315	354	50	214	206	3,638	3,502	46.6	41.2	75	50.9	49.1	84.0	16.0	63	1
Weekley's Improved (N. C. Grown).....	315	307	47	181	209	3,077	3,553	44.9	45.9	79	46.4	53.6	82.2	17.8	65	2
Latham's Double.....	315	304	74	127	188	2,159	3,196	44.3	45.6	72	40.3	59.7	86.1	13.9	62	3
Weekley's Improved (S. C. Grown).....	315	338	43	231	189	3,227	3,213	43.4	40.3	74	43.6	56.4	82.4	17.6	61	4
Parker's Prolific.....	315	292	46	142	193	2,414	3,281	43.1	40.3	76	42.3	57.7	81.5	18.5	62	5
Marlboro Prolific (Tenn. Grown).....	315	337	87	208	197	3,536	3,349	42.9	40.0	78	51.3	48.7	82.0	18.0	64	6
Cross No. 176.....	315	281	14	369	181	6,273	3,077	42.1	35.9	73	67.0	33.0	84.9	15.1	62	7
Golden Prolific.....	315	311	53	125	185	2,125	3,145	41.9	42.3	75	40.3	59.7	85.3	14.7	64	8
Batts' Four Ear (N. C. Grown).....	315	298	54	132	188	2,244	3,196	40.9	43.1	78	41.2	58.8	82.0	18.0	64	9
Raleigh Prolific.....	315	280	74	156	184	2,652	3,128	40.1	41.0	78	45.8	54.2	82.0	18.0	64	10
Goodman's Prolific.....	315	257	38	158	162	2,686	2,754	38.2	46.6	72	49.3	50.7	87.5	12.5	63	11
Cooke's Prolific.....	315	267	33	148	177	2,516	3,009	38.0	44.7	79	45.5	54.5	81.0	19.0	64	12
Simpkins' Prolific.....	315	287	63	94	176	1,598	2,992	37.8	41.2	79	34.8	65.2	82.2	17.8	65	13
Cross E-1XE-5.....	315	226	56	37	158	629	2,686	37.8	52.6	71	18.9	81.1	84.5	15.5	60	13
Gerrick's Prolific.....	315	298	24	152	168	2,584	2,856	36.1	38.1	79	47.5	52.5	79.7	20.3	63	14
Blount's Prolific.....	315	292	48	147	163	2,499	2,771	35.0	37.4	79	47.4	52.6	81.0	19.0	64	15
Stunnerour.....	315	287	26	145	155	2,465	2,635	34.2	37.4	77	48.3	51.7	83.1	16.9	64	16
One Ear Corn.....	315	241	10	102	148	1,734	2,516	33.5	43.7	75	40.8	59.2	81.3	18.7	61	17
Eureka.....	315	274	11	180	150	3,060	2,550	31.8	36.5	80	54.5	45.5	80.0	20.0	64	18
Biggs' Seven Ear.....	315	286	23	132	143	2,244	2,431	31.1	34.0	78	48.0	52.0	82.0	18.0	64	19
Improved Southern Snow Flake.....	315	241	37	34	126	578	2,142	30.1	39.0	78	48.0	52.0	82.0	18.0	64	20
White Majestic.....	315	235	31	76	119	1,292	2,023	26.9	34.6	75	38.9	61.1	85.3	14.7	64	21
Selection No. 170.....	315	186	13	102	108	1,734	1,836	26.6	45.0	69	48.5	51.5	81.1	18.9	56	22
Hickory King.....	315	247	31	109	106	7,303	1,802	25.0	31.8	72	50.6	49.4	81.7	15.3	61	23
Shenandoah White Dent.....	315	225	37	24	106	408	1,802	24.0	33.3	75	18.4	81.3	18.7	61	24	

TABLE IV.—VARIETY TEST OF CORN AT THE EDGECOMBE TEST FARM IN 1913—Continued.

Varieties	Stalks Per Plat		Yield Per Plat		Yield Per Acre			Total Weight			Shelling Capacity		Rank According to Yield			
	For Perfect Stand	By Actual Count	Barren Stalks	Pounds of Stover	Pounds of Ears	Pounds of Stover	Pounds of Ears	Bushels of Shelled Corn	Bushels of Shelled Corn With Perfect Stand	Pounds of Ears to Shell One Bushel	Per Cent. Stover	Per Cent. Ears		Per Cent. Grain	Per Cent. Cob	Weight of Measured Bushel of Shelled Corn
Crook's Prolific.....	315	209	20	26	104	442	1,768	23.8	35.5	74	20.0	80.0	78.3	21.7	58	25
Boone County.....	315	291	46	93	102	1,581	1,734	23.4	25.2	74	47.6	52.4	78.3	21.7	53	26
Southern Beauty.....	315	247	41	70	90	1,190	1,530	22.5	28.6	68	43.7	56.3	86.7	13.3	59	27
Selection No. 177.....	315	212	37	81	94	1,377	1,598	22.1	32.7	72	46.2	53.8	84.7	15.3	61	28
Deaton's Favorite.....	315	252	50	50	100	850	1,700	22.0	27.4	77	33.3	66.7	79.2	20.8	61	29
Craig's Red Cob Prolific.....	315	167	21	75	85	1,275	1,445	21.8	40.9	66	46.8	53.2	86.3	13.7	57	30
Columbia Beauty.....	315	171	6	91	89	1,547	1,513	21.5	39.3	73	50.5	49.5	83.5	16.5	61	31
First Gen. Cross No. 182.....	315	148	10	42	58	714	986	12.9	27.4	76	42.0	58.0	81.5	18.5	62	32

TABLE V.—VARIETY TEST OF CORN AT THE OXFORD TOBACCO STATION FARM IN 1913.

Parker's Prolific.....	158	187	31	58	61	1,972	2,074	29.6			48.7	51.3	88.5	11.5	1
Cooke's Prolific.....	158	162	19	53.5	60	1,819	2,040	29.1			47.1	52.9	73.3	26.7	2
Hickory King.....	158	171	19	60	59.5	2,040	2,023	28.9			50.2	49.8	89.0	11.0	3
Biggs' Seven Ear.....	158	172	24	60	58	2,040	1,972	28.1			50.8	49.2	77.5	22.5	4
First Gen. Cross No. 182.....	158	150	18	37	57	1,258	1,938	27.6			39.3	60.7	81.5	18.5	5
Cross No. 176.....	158	164	17	75	56	2,550	1,904	27.1			57.2	42.8	74.1	29.9	6
Selection No. 177.....	158	161	21	60	55	2,040	1,870	26.7			52.1	47.9	81.8	18.2	7
Southern Beauty.....	158	155	21	57	54	1,938	1,836	26.2			51.3	48.7	79.6	20.4	8
Goodman's Prolific.....	158	182	39	60	53	2,040	1,802	25.7			53.0	46.0	81.1	18.9	9
Weekley's Improved (N. C. Grown).....	158	167	27	47	53	1,598	1,002	25.7			47.0	53.0	71.7	28.3	10
Columbia Beauty.....	158	176	55	53	42	1,802	1,428	24.0			55.7	44.3	88.0	12.0	11
Gerrick's Prolific.....	158	163	24	65	42	2,210	1,428	24.0			60.7	39.3	79.7	20.3	12
Batts' Four Ear.....	158	197	58	80	41	2,720	1,394	19.9			66.1	33.9	78.0	21.0	1
Selection No. 170.....	158	154	44	73	39	2,482	1,326	18.9			65.1	34.9	74.3	25.7	2

TABLE VI.—COMPILED RESULTS OF VARIETY TEST OF CORN—IREDELL TEST FARM.

Varieties	1909			1910			1911			1912			1913			Average for Five Years
	Yield of Shelled Corn in Bushels Per Acre	Rank According to Yield of Shelled Corn in Test of this Year	Yield of Shelled Corn in Bushels Per Acre	Rank According to Yield of Shelled Corn in Test of this Year	Yield of Shelled Corn in Bushels Per Acre	Rank According to Yield of Shelled Corn in Test of this Year	Yield of Shelled Corn in Bushels Per Acre	Rank According to Yield of Shelled Corn in Test of this Year	Yield of Shelled Corn in Bushels Per Acre	Rank According to Yield of Shelled Corn in Test of this Year	Yield of Shelled Corn in Bushels Per Acre	Rank According to Yield of Shelled Corn in Test of this Year	Yield of Shelled Corn in Bushels Per Acre	Rank According to Yield of Shelled Corn in Test of this Year	Average Yield of Shelled Corn Per Acre	Rank According to Average Yield
Weekley's Improved	26.5	14	38.4	2	39.9	1	34.3	15	66.7	1	40.9	1	40.9	1		1
Southern Beauty	30.4	5	39.4	1	38.3	2	38.2	9	57.6	3	40.7	3	40.7	2		2
Parker's Prolific	34.2	1	35.2	6	34.0	9	41.4	4	42.7	13	37.5	13	37.5	3		3
Bigg's Seven Ear	26.0	17	29.5	16	32.4	16	45.0	1	48.8	6	36.3	6	36.3	4		4
Boone County	31.0	3	32.8	8	35.1	7	40.3	5	23.3	24	32.5	24	32.5	5		5
Hickory King	21.5	30	32.1	9	34.6	8	36.2	11	36.4	18	32.1	18	32.1	6		6
Goodman's Prolific	24.2	22	31.7	11	31.8	18	38.0	10	32.6	21	31.6	21	31.6	7		7

TABLE VII.—COMPILED RESULTS OF VARIETY TEST OF CORN—EDGECOMBE TEST FARM.

Varieties	1909			1910			1911			1912			1913			Average for Five Years
	Yield of Shelled Corn in Bushels Per Acre	Rank According to Yield of Shelled Corn in Test of this Year	Yield of Shelled Corn in Bushels Per Acre	Rank According to Yield of Shelled Corn in Test of this Year	Yield of Shelled Corn in Bushels Per Acre	Rank According to Yield of Shelled Corn in Test of this Year	Yield of Shelled Corn in Bushels Per Acre	Rank According to Yield of Shelled Corn in Test of this Year	Yield of Shelled Corn in Bushels Per Acre	Rank According to Yield of Shelled Corn in Test of this Year	Yield of Shelled Corn in Bushels Per Acre	Rank According to Yield of Shelled Corn in Test of this Year	Yield of Shelled Corn in Bushels Per Acre	Rank According to Yield of Shelled Corn in Test of this Year	Average Yield of Shelled Corn Per Acre	Rank According to Average Yield
Bigg's Seven Ear	41.5	1	31.9	2	26.5	3	21.1	1	31.1	19	30.4	19	30.4	1		1
Weekley's Improved	40.7	2	23.3	15	20.6	17	19.4	11	44.9	2	29.7	2	29.7	2		2
Goodman's Prolific	31.5	10	23.6	13	26.3	4	22.0	6	38.2	11	28.3	11	28.3	3		3
Hickory King	30.0	13	35.5	1	24.3	8	19.1	12	25.0	23	26.7	23	26.7	4		4
Parker's Prolific	15.6	18	26.0	8	23.4	10	25.0	2	43.1	5	26.6	5	26.6	5		5
Southern Beauty	27.2	21	31.3	3	27.6	2	15.0	21	22.5	27	24.9	27	24.9	6		6
Boone County	13.7	32	25.1	10	21.4	16	16.2	18	23.4	26	19.9	26	19.9	7		7

# VARIETIES OF CORN AND SOURCES OF SEED SEASON OF 1913.

<i>Variety</i>	<i>Sources of Seed</i>
1. Biggs' Seven Ear. ....	Noah Biggs ..... Scotland Neck, N. C.
2. Gerrick's Prolific. ....	Bureau of Plant Industry... Washington, D. C.
3. Cross No. 182. ....	Bureau of Plant Industry... Washington, C. D.
4. Cross No. 177. ....	Bureau of Plant Industry... Washington, D. C.
5. Cross No. 176. ....	Bureau of Plant Industry... Washington, D. C.
6. Selection No. 164. ....	Bureau of Plant Industry... Washington, D. C.
7. Selection No. 170. ....	Bureau of Plant Industry... Washington, D. C.
8. Parker's Prolific. ....	T. B. Parker. .... Raleigh, N. C.
9. Southern Beauty. ....	L. A. Stroupe. .... Tobaccoville, N. C.
10. Goodman's Prolific. ....	J. K. Goodman. .... Mt. Ulla, N. C.
11. Hickory King. ....	A. O. Lee. .... Hickory, Va.
12. Columbia Beauty. ....	T. W. Wood & Sons. .... Richmond, Va.
13. Batts' Four Ear (Ga.). ....	W. T. Broome. .... McBean, Ga.
14. Weekley's Improved (Native)	
Selection No. 35. ....	Iredell Test Farm. .... Statesville, N. C.
15. Cocke's Prolific. ....	Edgecombe Test Farm. .... Rocky Mount, N. C.
16. Weekley's Improved (S. C.). ....	J. F. Weekley. .... Ulmers, S. C.
17. E-1-Corn. ....	Coker & Company. .... Hartsville, S. C.
18. Marlboro Prolific. ....	R. T. Malone. .... Capleville, Tenn.
19. Eureka. ....	T. W. Wood & Sons. .... Richmond, Va.
20. Summerour. ....	D. A. Summerour. .... Marietta, Ga.
21. Boone County. ....	T. W. Wood & Sons. .... Richmond, Va.
22. Blount's Prolific. ....	T. W. Wood & Sons. .... Richmond, Va.
23. Jarvis' Golden Prolific. ....	J. M. Jarvis. .... Winston-Salem, N. C.
24. Latham's Double. ....	F. P. Latham. .... Belhaven, N. C.
25. Craig's Red Cob Prolific. ....	W. R. Craig. .... Sanford, N. C.
26. Simpkins' Prolific. ....	Summerset Farm Co. .... Creswell, N. C.
27. E-1XE-5 Bybred Corn. ....	Coker & Company. .... Hartsville, S. C.
28. Deaton's Favorite. ....	Chas. Deaton. .... Carthage, N. C.
29. Crook's Prolific Corn. ....	Crook Bros. .... Huron, Tenn.
30. Raleigh Prolific. ....	S. J. Betts. .... Raleigh, N. C.
31. Batts' Four Ear (N. C.). ....	J. F. Batts. .... Garner, N. C.
32. Shenandoah White Dent. ....	T. W. Wood & Sons. .... Richmond, Va.
33. White Majestic. ....	T. W. Wood & Sons. .... Richmond, Va.
34. Improved Southern Snow	
Flake. ....	T. W. Wood & Sons. .... Richmond, Va.
35. Brook's Pride. ....	Bureau of Plant Industry... Washington, D. C.
36. Rogers' White Dent. ....	Bureau of Plant Industry... Washington, D. C.
37. Chappel. ....	Bureau of Plant Industry... Washington, D. C.
38. Selection No. 181. ....	Bureau of Plant Industry... Washington, D. C.
39. Selection No. 138. ....	Bureau of Plant Industry... Washington, D. C.
40. Selection No. 120. ....	Bureau of Plant Industry... Washington, D. C.
41. Farley Yellow Dent. ....	Bureau of Plant Industry... Washington, D. C.
42. Smith's Yellow Dent (Winona	
Farm). ....	J. C. McClung. .... Kyle, Ohio
43. Whitson. ....	C. P. Whitson. .... Swannanoa, N. C.

**THE BULLETIN**  
**OF THE**  
**NORTH CAROLINA**  
**DEPARTMENT OF AGRICULTURE**

**RALEIGH**

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I. ANALYSES OF FERTILIZERS—FALL SEASON, 1913.

II. REGISTRATION OF FERTILIZERS.

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‡In coöperation with the Bureau of Plant Industry, United States Department of Agriculture.

## LETTER OF TRANSMITTAL.

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RALEIGH, N. C., February 15, 1914.

HON. W. A. GRAHAM,

*Commissioner of Agriculture.*

SIR:—I submit herewith analyses of fertilizers made in the laboratory of samples collected during the past full. These analyses show fertilizers to be about as heretofore, and to be, generally, what was claimed for them. I recommend that it be issued as the March BULLETIN.

Very respectfully,

B. W. KILGORE,

*State Chemist.*

Approved for printing:

W. A. GRAHAM,

*Commissioner.*



# I. ANALYSES OF FERTILIZERS—FALL SEASON, 1913.

By B. W. KILGORE,

W. G. HAYWOOD, J. Q. JACKSON, E. S. DEWAR, AND E. B. HART.

The analyses presented in this BULLETIN are of samples collected by the fertilizer inspectors of the Department, under the direction of the Commissioner of Agriculture, during the fall months of 1913. They should receive the careful study of every farmer in the State who uses fertilizers, as by comparing the analyses in the BULLETIN with the claims made for the fertilizers actually used, the farmer can know by or before the time fertilizers are put in the ground whether or not they contain the fertilizing constituents in the amounts they were claimed to be present.

## TERMS USED IN ANALYSES.

*Water-soluble Phosphoric Acid.*—Phosphate rock, as dug from the mines, mainly in South Carolina, Florida, and Tennessee, is the chief source of phosphoric acid in fertilizers.

In its raw, or natural state, the phosphate has three parts of lime united to the phosphoric acid (called by chemists tri-calcium phosphate). This is very insoluble in water and is not in condition to be taken up readily by plants. In order to render it soluble in water and fit for plant food, the rock is finely ground and treated with sulphuric acid, which acts upon it in such a way as to take from the three-lime phosphate two parts of its lime, thus leaving only one part of lime united to the phosphoric acid. This one-lime phosphate is what is known as water-soluble phosphoric acid.

*Reverted Phosphoric Acid.*—On long standing some of this water-soluble phosphoric acid has a tendency to take lime from other substances in contact with it, and to become somewhat less soluble. This latter is known as reverted or gone-back phosphoric acid. This is thought to contain two parts of lime in combination with the phosphoric acid, and is thus an intermediate product between water-soluble and the original rock.

Water-soluble phosphoric acid is considered somewhat more valuable than reverted, because it becomes better distributed in the soil as a consequence of its solubility in water.

*Available Phosphoric Acid* is made up of the water-soluble and reverted; it is the sum of these two.

*Water-soluble Ammonia.*—The main materials furnishing ammonia in fertilizers are nitrate of soda, sulphate of ammonia, cotton-seed meal, dried blood, tankage, and fish serap. The first two of these (nitrate of

soda and sulphate of ammonia) are easily soluble in water and become well distributed in the soil where plant roots can get at them. They are, especially the nitrate of soda, ready to be taken up by plants, and are therefore quick-acting forms of ammonia. It is mainly the ammonia from nitrate of soda and sulphate of ammonia that will be designated under the heading of water-soluble ammonia.

*Organic Ammonia.*—The ammonia in cotton-seed meal, dried blood, tankage, fish scrap, and so on, is included under this heading. These materials are insoluble in water, and before they can feed plants they must decay and have their ammonia changed, by the aid of the bacteria of the soil, to nitrates, similar to nitrate of soda.

They are valuable then as plant food in proportion to their content of ammonia, and the rapidity with which they decay in the soil, or rather the rate of decay, will determine the quickness of their action as fertilizers. With short season, quick-growing crops, quickness of action is an important consideration, but with crops occupying the land during the greater portion, or all, of the growing season, it is better to have a fertilizer that will become available more slowly, so as to feed the plant till maturity. Cotton-seed meal and dried blood decompose fairly rapidly, but will last the greater portion, if not all, of the growing season in this State. While cotton seed and tankage will last longer than meal and blood, none of these act so quickly, or give out so soon, as nitrate of soda and sulphate of ammonia.

*Total Ammonia* is made up of the water-soluble and organic; it is the sum of these two.

The farmer should suit, as far as possible, the kind of ammonia to his different crops, and a study of the forms of ammonia as given in the tables of analyses will help him to do this.

#### VALUATIONS.

To have a basis for comparing the values of different fertilizer materials and fertilizers, it is necessary to assign prices to the three valuable constituents of fertilizers—ammonia, phosphoric acid, and potash. These figures, expressing relative value per ton, are not intended to represent crop-producing power, or agricultural value, but are estimates of the commercial value of ammonia, phosphoric acid and potash in the materials supplying them. These values are only approximate (as the costs of fertilizing materials are liable to change, as other commercial products are), but they are believed to fairly represent the cost of making and putting fertilizers on the market. They are based on a careful examination of trade conditions, wholesale and retail, and upon quotations of manufacturers.

*Relative value per ton*, or the figures showing this, represents the prices on board the cars at the factory, in retail lots of five tons or less, for cash.

To make a complete fertilizer the factories have to mix together in proper proportions materials containing ammonia, phosphoric acid and potash. This costs something. For this reason it is thought well to have two sets of valuations—one for the raw or unmixed materials, such as acid phosphate, kainit, cotton-seed meal, etc., and one for mixed fertilizers.

The values used last season were:

#### VALUATIONS FOR 1913.

##### *In Unmixed or Raw Materials.*

For phosphoric acid in acid phosphate.....	4	cents per pound.
For phosphoric acid in bone meal and Peruvian Guano.	3½	cents per pound.
For phosphoric acid in basic slag.....	4	cents per pound.
For nitrogen .....	19½	cents per pound.
For potash .....	4	cents per pound.

##### *In Mixed Fertilizers.*

For phosphoric acid .....	4½	cents per pound.
For nitrogen .....	21	cents per pound.
For potash .....	5	cents per pound.

#### HOW RELATIVE VALUE IS CALCULATED.

In the calculation of relative value it is only necessary to remember that so many per cent means the same number of pounds per hundred, and that there are twenty hundred pounds in one ton (2,000 pounds).

With an 8-2-1.65 goods, which means that the fertilizer contains available phosphoric acid 8 per cent, potash 2 per cent, and nitrogen 1.65 per cent, the calculation is made as follows:

<i>Percentage or Lbs. in 100 Lbs.</i>	<i>Value Per 100 Lbs.</i>	<i>Value Per Ton, 2,000 Lbs.</i>
8 pounds available phosphoric acid at 4½ cents...	0.36 × 20 =	\$ 7.20
2 pounds potash at 5 cents.....	0.10 × 20 =	2.00
1.65 pounds nitrogen at 21 cents.....	0.347 × 20 =	6.95
Total value .....	0.817 × 20 =	\$16.14

Freight and merchant's commission must be added to these prices.

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition of Parts per 100.							Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.		
MIXED FERTILIZERS.											
Brands claiming				8.00			.82	1.00	3.00	\$ 13.64	
3334	Armour Fertilizer Works, Greensboro, N. C.	Armour's 8-1-3 Fertilizer	Crouse	8.36	.11	.52	.63	.77	2.96	13.13	
3364	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Comet Guano.	Esther	8.52	.23	.62	.85	1.03	3.56	14.80	
3373	Va.-Car. Chemical Co., Richmond, Va.	Harvester	Seagrove	9.92	.65	.34	.99	1.20	3.18	16.27	
3126	do.	McCormick's Wheat and Grain Guano.	North Wilkesboro	8.42	.95	.22	1.17	1.42	3.02	15.51	
Brands claiming				8.00			.82	1.00	4.00	14.64	
3415	American Agricultural Chemical Co., New York, N. Y.	Fidelity Grain Grower	Landis	9.71	.57	.20	.77	.91	3.80	15.77	
3070	do.	do.	Davidson	8.85	.93	.30	1.23	1.50	2.38	15.51	
3277	Bryant Fertilizer Co., Alexandria, Va.	Bryant's Special Formula for Grain and Grass.	Burlington	8.64	.37	.18	.55	.66	4.34	14.43	
3106	Carolina Warehouse Co., Salisbury, N. C.	Farmers' Union 8-1-4.	Greensboro	7.86	.63	.22	.85	1.03	3.68	14.32	
3454	Georgia Chemical Co., Augusta, Ga.	Buyers' Special Mixture	Durham	8.27	.57	.24	.81	.98	4.28	15.12	
3316	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Farmers' Favorite.	Burlington	8.07	.13	.68	.81	.98	3.48	14.48	
3105	United States Fertilizer Co., Baltimore, Md.	Farm Bell Pennant Winner	Greensboro	8.53	.35	.40	.75	.91	4.02	14.85	
Brand claiming				8.00			.82	1.00	5.00	15.64	
3398	Union Guano Co., Winston, N. C.	Special Mixture.	Ararat	8.85	.21	.40	.61	.74	4.84	15.37	
Brand claiming				8.00			.82	1.00	6.00	16.64	
3104	United States Fertilizer Co., Baltimore, Md.	Farm Bell Wheat, Oat, and Corn Special.	Greensboro	8.72	.33	.52	.85	1.03	5.96	17.38	

	Brands claiming		8.00			1.00	1.22	3.00	14.40
3245	Baugh & Sons Co., Norfolk, Va.	Baugh's Southern States Excelsior	7.66		.61	1.21	1.47	4.16	16.14
3085	Pocahontas Guano Co., Lynchburg, Va.	A. A. Complete Champion Brand	8.41		.71	.91	1.11	2.52	13.91
	Brands claiming		8.00			1.00	1.22	4.00	15.40
3421	Carolina-Union Fertilizer Co., Norfolk, Va.	Carolina-Union 1.21-S-4	8.53		.09	1.07	1.30	3.60	15.76
3408	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Wheat, Corn, and Peanut Manure.	8.26		.79	1.01	1.23	4.02	15.70
	Brands claiming		8.00			1.65	2.00	2.00	16.13
3335	Acme Manufacturing Co., Wilmington, N. C.	Acme Special Grain Fertilizer	8.86		1.65	1.14	2.18	1.90	17.39
3363	do	Gem Fertilizer	8.12		.49	1.10	1.93	2.56	16.55
3443	Adair, A. D., & McCarty Co., Chattanooga, Tenn.	Adair's Ammoniated Dissolved Bone	8.31		.99	1.14	2.59	3.18	19.60
3424	American Agricultural Chemical Co., New York, N. Y.	Canton Chemical Co.'s Baker's Fish Guano.	8.28		1.21	1.61	1.96	2.16	16.37
3430	do	Detrick's Fish Manure	8.06		1.05	1.55	1.88	2.00	15.76
3417	do	Detrick's Royal Crop Grower	9.09		1.19	.30	1.49	1.98	16.42
3091	do	Zell's Calvert Guano	8.31		1.23	.36	1.59	2.02	16.18
3154	do	Zell's Fish Guano	8.37		1.17	.34	1.51	1.84	15.81
3453	American Fertilizer Co., Norfolk, Va.	A. L. Hannah's Special Formula Guano	8.90		1.05	.64	1.69	2.06	17.18
3156	do	Bone and Phosphate Guano	8.95		.93	.32	1.25	1.52	15.22
3058	do	do	8.44		.75	.32	1.07	1.30	13.95
3219	Armour Fertilizer Works, Greensboro, N. C.	Armour's Slaughter House Fertilizer	8.04		.81	.76	1.57	2.06	15.89
3325	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Complete Fertilizer.	7.12		.29	1.36	1.65	2.20	15.54
3406	Atlantic Chemical Co., Norfolk, Va.	Atlantic Special Wheat Fertilizer	8.24		.92	.70	1.62	2.12	16.34
3244	Baugh & Sons Co., Norfolk, Va.	Baugh's Animal Base and Potash Compound.	8.19		1.05	.68	1.73	2.42	17.06
3311	do	do	8.10		.93	.60	1.53	2.26	15.98
3131	do	Baugh's Wheat Fertilizer	8.14		.97	.64	1.61	1.62	15.71
3397	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Crown Brand Ammoniated Guano	7.92		.77	1.06	1.83	2.20	17.01

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition of Parts per 100.						Relative Value per Ton at Factory.
				Available Phosphate.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	
MIXED FERTILIZERS.										
Brands claiming				8.00	---	---	1.65	2.00	2.00	\$ 16.13
3432	Carolina-Union Fertilizer Co., Norfolk, Va.	Carolina-Union 2-2-2	Mount Airy	8.65	.27	1.36	1.63	1.98	2.18	16.81
3108	Carolina Warehouse Co., Salisbury, N. C.	Farmers' Union 8-2-2 Guano	Greensboro	8.27	1.09	.40	1.49	1.81	2.18	15.88
3221	Columbia Guano Co., Norfolk, Va.	Columbia Soluble Guano.	Conover	8.04	1.01	.52	1.53	1.86	2.30	15.96
3166	Conestee Chemical Co., Wilmington, N. C.	Conestee Standard Guano	Maiden	8.15	.57	1.22	1.79	2.18	2.10	16.95
3288	Etiwan Fertilizer Co., Charleston, S. C.	Plow Brand Ammoniated Guano.	Salisbury	9.45	.87	.66	1.53	1.86	2.04	16.97
3176	Farmers' Guano Co., Raleigh, N. C.	State Standard Guano.	Gold Hill	7.98	.65	1.18	1.83	2.22	2.92	17.79
3298	Georgia Chemical Works, Augusta, Ga.	Georgia Formula.	North Wilkesboro	8.25	1.29	.32	1.61	1.96	2.16	16.35
3067	Imperial Guano Co., Norfolk, Va.	Champion Guano.	Davidson	7.99	1.19	.36	1.55	1.88	2.30	16.00
3345	Lee, A. S., & Sons Co., Richmond, Va.	Lee's 8-2-2 Fertilizer.	Burlington	7.88	1.45	.42	1.87	2.27	1.82	16.77
3142	Lister's Agricultural Chemical Works, Newark, N. J.	Lister's Success Fertilizer.	Rockwell	8.75	1.15	.46	1.61	1.96	2.04	16.68
3337	Hampton Guano Co., Norfolk, Va.	Shirley Superphosphate.	Maiden	8.15	1.23	.54	1.77	2.15	2.10	16.87
3187	Marietta Fertilizer Co., Greensboro, N. C.	Marietta Solid South.	Reidsville	7.82	.81	.68	1.49	1.81	2.08	15.38
3199	Martin Fertilizer Co., Norfolk, Va.	Martin's Carolina Cotton Grower	Lawndale	8.10	.69	.60	1.29	1.57	2.24	14.95
3289	do	Martin's Special Grain Grower	Salisbury	8.04	.50	.53	1.03	1.25	2.48	14.04
3255	Miller Fertilizer Co., Baltimore, Md.	Ammoniated Dissolved Bone	Siler City	8.23	.90	.89	1.79	2.18	2.52	17.44
3256	do	Farmers' Profit.	Liberty	7.64	1.05	.72	1.77	2.15	3.06	17.37

3433	Navassa Guano Co., Wilmington, N. C.	Navassa Grain Fertilizer.	Pinnacle	8.57	1.19	.26	1.45	1.76	2.20	16.00
3290	Patapsco Guano Co., Baltimore, Md.	Sea Gull Ammoniated Guano	Granite Quarry	9.23	.93	.50	1.43	1.74	2.14	16.45
3456	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Cultivator Guano	Reidsville	8.01	.33	1.38	1.71	2.08	2.10	16.49
3144	Navassa Guano Co., Wilmington, N. C.	Navassa Grain Grover	Rockwell	8.77	.53	1.06	1.59	1.93	2.80	17.37
3315	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Bone and Peruvian Mixture	Burlington	8.30	.31	1.22	1.53	1.86	2.40	16.30
3367	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters' Standard Fertilizer	Wadesboro	8.20	.45	1.34	1.79	2.18	1.70	16.60
3291	Peachontas Guano Co., Lynchburg, Va.	Carrington's Banner Brand Guano	Gold Hill	9.55	.46	.91	1.37	1.67	1.98	16.33
3092	do	do	Madison	7.78	1.07	.48	1.55	1.88	1.88	15.39
3279	Pocomoke Guano Co., Norfolk, Va.	Pamlico Superphosphate	Kernersville	9.04	1.01	.60	1.61	1.96	2.74	17.64
3370	do	do	Seagrove	7.72	1.25	.34	1.59	1.93	2.00	15.63
3268	Richmond Guano Co., Richmond, Va.	Premium Brand Fertilizer	Albemarle	8.11	.77	.84	1.61	1.96	2.34	16.40
3082	Robertson Fertilizer Co., Norfolk, Va.	Double Dollar Soluble Guano	Glenola	8.05	.49	.92	1.41	1.71	2.34	15.51
3242	Royster, F. S., Guano Co., Norfolk, Va.	Farmers' Bone Fertilizer	Kernersville	7.10	1.03	.60	1.63	1.98	2.66	15.90
3174	do	Royster's Special Wheat Fertilizer	Faith	8.24	.56	.93	1.49	1.81	1.98	15.65
3292	Swift Fertilizer Works, Wilmington, N. C.	Swift's Red Steer	Salisbury	7.09	.49	1.14	1.63	1.98	2.26	15.49
3258	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Standard	Siler City	8.30	.64	.89	1.53	1.86	1.96	15.86
3175	do	do	Granite Quarry	7.98	.75	.68	1.43	1.74	1.98	15.17
3254	Union Guano Co., Winston, N. C.	Fish Brand Ammoniated Guano	Siler City	8.20	1.41	.38	1.79	2.18	1.80	16.70
3409	do	do	Elkin	8.87	1.15	.30	1.45	1.76	2.26	16.33
3103	do	Old Honesty Guano	Greensboro	8.09	1.43	.38	1.81	2.20	2.00	16.88
3239	United States Fertilizer Co., Baltimore, Md.	Farm Bell Standard Guano	Kernersville	8.51	.35	1.10	1.45	1.76	2.80	16.55
3429	Va-Car. Chemical Co., Richmond, Va.	A. & A.'s Anchor Brand Fertilizer	Dunn	9.26	.69	.44	1.13	1.37	2.53	15.66
3152	do	Davie & Whitte's Owl Brand Guano	Rutherfordton	9.32	1.41	.34	1.75	2.13	2.90	18.64
3057	do	Old Dominion Farmers' Friend Fertilizer	Graves Siding	8.33	1.17	.38	1.55	1.88	2.62	16.63
3218	do	Old Dominion Soluble Guano	Maiden	8.47	1.05	.34	1.39	1.69	2.46	15.92
3127	do	Southern Chemical Co.'s Electric Standard Guano	North Wilkesboro	8.07	.99	.50	1.49	1.81	2.04	15.36

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.						Relative Value per Ton at Factory.
				Available Phosphate Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	
MIXED FERTILIZERS.										
Brands claiming										
3116	Va.-Car. Chemical Co., Richmond, Va.	Tinsley & Co.'s Stonewall Guano.	Winston.	8.00	1.13	.36	1.65	2.00	2.00	\$ 16.13
3089	do.	Travers & Co.'s Beef Blood and Bone Fertilizer.	North Wilkesboro	8.47	1.19	.20	1.49	1.81	1.98	15.86
3374	do.	Travers & Co.'s National Fertilizer.	Seagrove.	8.82	.89	.46	1.39	1.69	2.48	16.26
3434	do.	V.-C. C. Co.'s Plant Food.	Pilot Mountain.	8.14	1.07	1.04	1.35	1.64	2.18	15.18
Brand claiming										
3343	Baugh & Sons Co., Norfolk, Va.	Baugh's Complete Animal Base Fertilizer.	Burlington.	7.72	.97	.76	2.11	2.57	2.04	17.85
Brands claiming										
3069	Lister's Agricultural Chemical Works, Newark, N. J.	Lister's Ammoniated Dissolved Bone Phosphate.	Concord.	8.00	1.45	.48	1.65	2.00	5.00	19.13
3286	Putapsco Guano Co., Baltimore, Md.	Putapsco Guano.	Moorestville.	7.91	.44	1.31	1.73	2.10	5.00	19.38
Brands claiming										
3393	Coe-Mortimer Co., Charleston, S. C.	Coe-Mortimer Co.'s Cotton and Corn Fertilizer.	Hildebran.	8.00	1.45	.48	2.06	2.50	2.00	17.85
3407	Putapsco Guano Co., Baltimore, Md.	Putapsco Guano.	North Wilkesboro	9.07	1.45	.48	1.93	2.35	2.20	18.47
3455	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Guano for Tobacco.	Reidsville.	10.34	.44	1.31	1.75	2.13	2.18	18.84
3225	Va.-Car. Chemical Co., Richmond, Va.	Powers, Gibbs & Co.'s Carolina Golden Belt Ammo. Guano for Tobacco.	Mount Airy.	8.00	1.41	.34	2.06	2.50	3.00	18.85
Brands claiming										
3446	Acme Mfg. Co., Wilmington, N. C.	Acme 8-3-3 C. S. M.	Tabor.	8.27	.83	.58	2.41	2.93	3.20	20.76
				8.26	1.43	.52	1.95	2.37	2.84	18.46
				8.29	.41	1.52	1.93	2.35	3.24	18.81
				9.11	1.41	.34	1.75	2.13	2.64	18.19
				8.00	.73	1.58	2.47	3.00	3.00	20.57
				8.38			2.31	2.81	3.00	20.24

3416	American Agricultural Chemical Co., New York, N. Y.	Detrick's Victory Cotton Fertilizer.....	Landis.....	8.04	1.35	.94	2.29	2.78	2.86	19.71
3453	do.....	Zell's Reliance High Grade Manure.....	Lattimore.....	7.84	1.61	.70	2.31	2.81	2.88	19.64
3379	American Fertilizer Co., Norfolk, Va.....	American Eagle Guano.....	Catawba.....	8.59	1.63	.38	2.01	2.44	2.32	18.49
3220	Armour Fertilizer Works, Greensboro, N. C.....	Armour's 8-3-3 Fertilizer.....	Gastonia.....	8.20	1.21	.82	2.03	2.47	2.78	18.69
3324	Asheville Packing Co., Asheville, N. C.....	Asheville Packing Co.'s Complete Fertilizer.....	Asheville.....	5.15	.47	1.88	2.35	2.86	4.00	18.50
3336	Atlantic Chemical Co., Norfolk, Va.....	Atlantic High Grade Soluble Guano.....	Maiden.....	7.83	.65	1.68	2.33	2.83	3.30	20.13
3418	Baugh & Sons Co., Norfolk, Va.....	Baugh's Grand Rapid High Grade Guano.....	China Grove.....	8.03	1.81	.60	2.41	2.23	3.48	20.83
3344	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.....	Caraleigh Eclipse.....	Burlington.....	7.62	1.05	1.32	2.37	2.88	3.24	20.05
3136	Carolina Warehouse Co., Salisbury, N. C.....	Farmers' Union Guano.....	Salisbury.....	8.22	1.49	1.06	2.55	3.10	3.58	21.69
3177	Farmers Guano Co., Raleigh, N. C.....	Money Point Guano.....	Gold Hill.....	8.00	.75	1.48	2.23	2.71	3.46	20.01
3260	Georgia Chemical Co., Augusta, Ga.....	Intensive Formula.....	Siler City.....	9.64	1.47	.44	1.91	2.32	2.58	19.28
3068	Imperial Co., Norfolk, Va.....	X. L. O. Cotton Guano.....	Davidson.....	8.03	1.55	.52	2.07	2.52	2.74	19.66
3267	Marietta Fertilizer Co., Greensboro, N. C.....	Marietta Pride of Piedmont.....	Albemarle.....	8.62	.99	1.00	1.99	2.42	2.94	19.06
3448	Navassa Guano Co., Wilmington, N. C.....	Navassa High Grade Guano.....	Tabor.....	9.00	1.51	.58	2.09	2.54	2.64	19.52
3188	Old Buck Guano Co., Richmond, Va.....	Old Buck Quincy Tobacco and Garden Fertilizer.....	Roxboro.....	7.28	.69	1.60	2.29	2.78	3.60	19.77
3285	Patapsco Guano Co., Baltimore, Md.....	Choctaw Guano.....	Mooresville.....	8.02	.42	1.37	1.79	2.18	3.02	17.76
3365	Planters Fertilizer Co., Charleston, S. C.....	Planters' Soluble Guano.....	Wadesboro.....	9.12	.57	1.62	2.19	2.66	3.10	20.51
3165	Royster, F. S., Guano Co., Norfolk, Va.....	Marlboro High Grade Cotton Grower.....	Newton.....	8.45	1.31	.84	2.15	2.61	3.22	19.85
3252	Swift Fertilizer Works, Wilmington, N. C.....	Swift's Ruralist High Grade Guano.....	Burgaw.....	7.75	.59	2.08	2.67	3.25	4.02	22.21
3217	Union Guano Co., Winston, N. C.....	Union Homestead Guano.....	Hickory.....	9.82	1.35	.34	1.69	2.05	2.40	18.34
3197	Venable Fertilizer Co., Richmond, Va.....	Ballard's Choice Fertilizer.....	Kings Mountain.....	7.91	1.11	1.20	2.31	2.81	3.59	20.41
3332	Va-Car. Chemical Co., Richmond, Va.....	Norfolk and Carolina Chemical Co.'s Amazon High Grade Guano.....	Mount Olive.....	9.64	1.71	.66	2.37	2.88	3.16	21.79
3451	do.....	Old Dominion Guano Co.'s Farmers' Friend Special.....	Chadbourn.....	8.73	1.23	.58	1.81	2.20	3.54	19.00
3185	do.....	V-C. C. Co.'s Gold Medal High Grade Tobacco Guano.....	Durham.....	8.77	.97	1.38	2.35	2.86	2.64	20.40
3439	do.....	V-C. C. Co.'s Royal High Grade Fertilizer.....	Raleigh.....	9.00	1.81	.36	2.17	2.64	3.08	20.27

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.							Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.		
MIXED FERTILIZERS.											
	Brand claiming			8.00			2.47	3.00	10.00	\$ 27.57	
3253	Swift Fertilizer Works, Wilmington, N. C.	Swift's Strawberry Grower, High Grade	Wilmington	6.39	.45	2.14	2.59	3.15	10.42	27.05	
	Brands claiming			8.00			3.29	4.00	4.00	25.02	
3331	Acme Fertilizer Works, Wilmington, N. C.	Acme O. K. Fertilizer	Mount Olive	8.60	1.53	1.36	2.89	3.51	4.36	24.22	
3205	Armour Fertilizer Works, Greensboro, N. C.	Armour's No. 844 Fertilizer	Denton	8.17	1.75	1.06	2.81	3.42	4.86	24.01	
3302	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' 8-4-4 Union Guano	Salisbury	8.36	2.17	.70	2.87	3.49	4.24	23.82	
3447	Navassa Guano Co., Wilmington, N. C.	Navassa Special Truck Guano	Tabor	9.34	2.33	.54	2.87	3.49	3.34	23.80	
2427	Pearsall & Co., Wilmington, N. C.	Pearsall's Fish and Potash Compound Guano.	Wallace	7.15	1.15	2.12	3.27	3.98	3.84	24.01	
3366	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters' Special Cotton Fertilizer	Wadesboro	8.67	1.39	1.60	2.99	3.64	4.18	24.54	
3102	Union Guano Co., Winston, N. C.	Union Premium Guano.	Greensboro	9.41	2.29	.32	2.61	3.17	2.64	22.07	
3450	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Durham High Grade.	Chadbourne	8.12	2.35	.84	3.19	3.88	4.12	24.77	
3428	do	V.-C. C. Co.'s Special	Wallace	8.94	2.03	.42	2.45	2.98	3.84	22.18	
	Brand claiming			8.00			4.11	5.00	7.00	31.46	
3109	Armour Fertilizer Works, Greensboro, N. C.	Blood, Bone, and Potash Fertilizer	Greensboro	7.80	2.55	1.96	2.51	3.05	6.50	28.26	
	Brand claiming			8.50			2.26	2.75	2.00	19.14	
3186	Va.-Car. Chemical Co., Richmond, Va.	A. & A.'s Anchor Brand Fertilizer	Durham	8.94	.30	1.89	2.19	2.66	2.08	19.32	
	Brands claiming			9.00			.82	1.00	2.00	13.54	
3189	American Fertilizing Co., Norfolk, Va.	American Bone Mixture	Reidsville	9.07	.55	.28	.83	1.01	2.18	13.83	

3259	Baugh & Sons Co., Norfolk, Va.....	Baugh's Grain and Grass Grower.....	Liberty.....	9.29	.47	.32	.79	.96	2.68	14.36
3241	Royster, F. S., Guano Co., Norfolk, Va.....	Royster's Special.....	Kernersville.....	9.87	.45	.40	.85	1.03	2.34	14.79
3317	Va.-Car. Chemical Co., Richmond, Va.....	V.-C. Co.'s Baltimore Special Mix- ture.	Hillsboro.....	9.65	.56	.45	1.01	1.23	2.22	15.15
<b>Brands claiming</b>										
3425	American Agricultural Chemical Co., New York, N. Y.	Mogul Fertilizer.....	Mooresville.....	9.67	.57	.20	.77	.94	3.46	15.40
3246	Armour Fertilizer Works, Greensboro, N. C.....	Armour's No. 193 Fertilizer.....	Winston.....	9.17	.71	.46	1.17	1.42	2.72	15.89
3310	Baugh & Sons Co., Norfolk, Va.....	Baugh's Grain and Grass Grower.....	Statesville.....	8.80	.47	.36	.83	1.01	2.22	13.63
3226	Martin Fertilizer Co., Norfolk, Va.....	Martin's Dissolved Organic Compound.....	Pilot Mountain.....	9.37	.27	.56	.83	1.01	2.43	14.40
3198	do.....	Martin's Special Grain Grower.....	Lawndale.....	9.02	.29	.50	.79	.96	3.54	14.98
3143	Navyssa Guano Co., Wilmington, N. C.....	Long's Wheat and Grass Guano.....	Rockwell.....	8.79	.21	.68	.89	1.08	3.23	14.93
3128	Patapasco Guano Co., Baltimore, Md.....	Coon Brand Guano.....	North Wilkesboro.....	8.86	.39	.64	1.03	1.25	3.06	15.36
3380	Powhatan Chemical Co., Richmond, Va.....	Powhatan Grain Guano.....	Charlotte.....	9.10	.45	.30	.75	.91	3.58	14.92
3243	Royster, F. S., Guano Co., Norfolk, Va.....	Royster's Grain Guano.....	Winston-Salem.....	9.00	.53	.40	.93	1.13	3.08	15.09
3257	Tuscarora Fertilizer Co., Greensboro, N. C.....	Tuscarora Fertilizer No. 913.....	Siler City.....	9.42	.52	.25	.77	.94	3.02	14.73
3196	Union Guano Co., Winston, N. C.....	B. S. Grain Ammoniated Guano.....	Lawndale.....	9.49	.41	.18	.59	.72	3.30	14.32
3280	Va.-Car. Chemical Co., Richmond, Va.....	A. & A.'s Little Giant Grain and Grass Grower.	Mocksville.....	8.13	.57	.16	.73	.89	2.72	13.10
3435	do.....	Bernhardt's Grain and Crop Guano.....	Walnut Cove.....	8.35	.75	.28	1.03	1.25	3.40	15.24
3084	do.....	Bigelow's Crop Grower.....	Trinity.....	9.44	.33	.52	.85	1.03	2.98	15.05
<b>Brand claiming</b>										
3394	Robertson Fertilizer Co., Norfolk, Va.....	Robertson's Blood and Bone Mixture.....	Shelby.....	9.24	.53	.38	.91	1.11	1.98	14.12
<b>Brand claiming</b>										
3383	Va.-Car. Chemical Co., Richmond, Va.....	A. & A.'s Star Brand Guano.....	Lenoir.....	10.44	.61	.18	.79	.96	2.12	14.83
<b>Brand claiming</b>										
3392	Coe-Mortimer Co., Charleston, S. C.....	Knickerbocker Standard.....	Hildebran.....	9.00	1.27	.32	1.59	1.93	2.08	16.49
<b>Brand claiming</b>										
3314	Armour Fertilizer Works, Greensboro, N. C.....	Armour's Bone and Dissolved Bone with Potash.	Burlington.....	8.82	.71	.68	1.39	1.69	3.42	17.20

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.						Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	
MIXED FERTILIZERS.										
	Brands claiming			9.00			1.65	2.00	3.00	\$ 18.03
3107	Carolina Warehouse Co., Salisbury, N. C.	Farmers' Union 9-2-3 Guano	Greensboro	11.84	1.25	.32	1.57	1.91	3.62	20.87
3419	Powhatan Chemical Co., Richmond, Va.	North Carolina Favorite	Lawndale	9.06	.87	.76	1.63	1.98	3.62	18.62
3387	Union Guano Co., Winston, N. C.	Farmers Blood and Bone Guano	Cornelius	9.47	1.03	.24	1.27	1.54	2.52	16.38
	Brand claiming			9.00			1.85	2.25	1.00	16.87
3155	Bradley Fertilizer Co., Boston, Mass.	Standard Seafowl Guano	Charlotte	10.05	1.09	.74	1.83	2.22	1.40	18.13
	Brand claiming			9.00			1.85	2.25	4.00	19.87
3278	Pocomoke Guano Co., Norfolk, Va.	Monticello Animal Bone Fertilizer	Kernersville	9.14	1.19	.50	1.69	2.05	3.96	19.28
	Brand claiming			9.00			2.47	3.00	2.00	20.47
3441	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s L. and M. Special.	Raleigh	9.73	2.19	.24	2.43	2.95	1.80	20.76
	Brands claiming			10.00			.82	1.00	3.00	15.44
3444	Royster, F. S., Guano Co., Norfolk, Va.	Haywood County Special Guano	Waynesville	10.12	.21	.42	.63	.77	4.20	15.95
3381	Swift Fertilizer Works, Wilmington, N. C.	Swift's Planters' Special Standard	Newton	9.21	.35	.46	.81	.98	3.52	15.21
	Brand claiming			10.00			1.03	1.25	2.00	15.33
3461	Farmers Guano Co., Norfolk, Va.	Farmers' Grain Grower	Mount Airy	10.79	.51	.46	.97	1.18	2.40	16.18
	Brands claiming			10.00			1.03	1.25	6.00	19.33
3247	Carolina Warehouse Co., Salisbury, N. C.	Farmers' Union 10-1.25-6 Guano	Winston-Salem	11.19	.75	.12	.87	1.06	5.42	19.15

3163	Union Guano Co., Winston, N. C.	Grain Chemical	Conover	10.41	.77	.08	.85	1.03	5.58	18.52
	Brand claiming			10.00			1.65	2.00	5.00	20.93
3440	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Special Grain Mixture	Raleigh	10.60	1.49	.22	1.71	2.08	4.24	20.96
	Brands claiming			10.00			3.29	4.00	4.00	26.82
3414	Armour Fertilizer Works, Greensboro, N. C.	Armour's 10-4-4 Fertilizer	China Grove	9.79	1.19	1.72	2.91	3.54	4.84	25.87
3395	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Electric High Grade Special Guano	Morganton	10.30	2.73	.16	2.89	3.51	3.98	25.39
	Brand claiming			10.00			3.29	4.00	5.00	27.82
3386	Armour Fertilizer Works, Greensboro, N. C.	Armour's 10-4-5 Fertilizer	Taylorsville	9.14	1.23	1.78	3.01	3.66	5.58	26.45
	Brand claiming			6.00			1.65	2.00	5.00	17.33
3240	Royster, F. S., Guano Co., Norfolk, Va.	Royster's 2-6-5 Special	Kernersville	5.81	.85	.74	1.59	1.93	5.02	16.93
	Brands claiming			6.00			4.11	5.00	7.00	29.66
3330	Armour Fertilizer Works, Greensboro, N. C.	Armour's 5 Per Cent Trucker	Wilmington	5.80	2.39	1.30	3.69	4.49	6.86	27.58
3449	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Special Truck Guano	Chadbourn	7.12	2.99	.70	3.69	4.49	8.16	30.07
	Brands claiming			8.00					4.00	11.20
3369	Acme Mfg. Co., Wilmington, N. C.	Acme Bone and Potash	Candor	8.80					3.08	11.00
3094	American Agricultural Chemical Co., New York, N. Y.	Palmetto Alkaline Phosphate	Elkin	8.98					3.90	11.98
3157	American Fertilizer Co., Norfolk, Va.	American Special Potash Mixture for Wheat	Monroe	7.77					4.70	11.68
3145	Armour Fertilizer Works, Greensboro, N. C.	Armour's Phosphate and Potash	Albemarle	8.31					3.42	10.90
3360	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Special Bone and Potash	Asheville	10.42					2.50	11.88
3410	Atlantic Chemical Co., Norfolk, Va.	Atlantic 8-4 Bone and Potash Mixture	Raeftord	7.83					3.46	10.51
3347	Bryant Fertilizer Co., Alexandria, Va.	Bryant's Wheat Grower	Burlington	8.27					5.18	12.62
3117	Carolina Warehouse Co., Salisbury, N. C.	Farmers' Union 8-4 Bone and Potash	Winston	9.32					3.00	11.39
3179	Farmers Guano Co., Raleigh, N. C.	Special Bone and Potash Mixture	Gold Hill	10.28					3.94	13.19
3209	Georgia Chemical Works, Augusta, Ga.	Acid Phosphate with 4 Per Cent Potash	Denton	8.48					3.72	11.35
3060	Imperial Co., Norfolk, Va.	Yadkin Wheat Grower	Ether	7.90					3.92	11.02
3252	do.	do.	Burlington	8.16					3.72	11.06

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.					Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	
								Total Potash.	
MIXED FERTILIZERS.									
	<b>Brands claiming.</b>			8.00	---	---	---	---	4.00 \$ 11.20
3222	Marietta Fertilizer Co., Greensboro, N. C.	Marietta Golden Grain Grower.	Mount Airy	8.36	---	---	---	---	4.02 11.54
3401	Powhatan Chemical Co., Richmond, Va.	Powhatan Bone and Potash Mixture.	Mount Airy	9.47	---	---	---	---	3.84 12.36
3074	Royster, F. S., Guano Co., Norfolk, Va.	Royster's 8-4 Bone and Potash Mixture.	Charlotte.	8.76	---	---	---	---	4.00 11.88
3375	Swift Fertilizer Works, Atlanta, Ga.	Swift's Plantation Standard Grade Phosphate and Potash.	Trinity.	7.99	---	---	---	---	4.06 11.25
3112	United States Fertilizer Co., Baltimore, Md.	Farm Bell Wheat and Grass Grower.	Greensboro.	8.51	---	---	---	---	5.42 13.08
3139	Union Guano Co., Winston, N. C.	Union Wheat Mixture.	Richfield.	9.85	---	---	---	---	4.00 12.86
3079	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Carr's Special Wheat Grower.	Trinity	8.82	---	---	---	---	4.16 12.10
3081	do	Southern Chemical Co.'s Chick's Special Wheat Compound.	Newsom.	9.71	---	---	---	---	4.40 13.14
3158	do	S. W. Travers & Co.'s Special Wheat Compound.	Iron Station.	7.42	---	---	---	---	4.50 11.18
3097	do	Va. State Fert. Co.'s Gilt Edge Brand Dissolved Bone and Potash.	North Wilkesboro	10.92	---	---	---	---	3.46 13.29
	<b>Brand claiming.</b>			8.00	---	---	---	---	5.00 12.20
3350	United States Fertilizer Co., Baltimore, Md.	Farm Bell Phosphate and Potash.	Elkland.	8.98	---	---	---	---	5.16 13.24
	<b>Brand claiming.</b>			9.00	---	---	---	---	3.00 11.10
3351	Armour Fertilizer Works, Greensboro, N. C.	Armour's Phosphate and Potash Fertilizer.	Burlington.	9.72	---	---	---	---	2.94 11.69
	<b>Brands claiming.</b>			10.00	---	---	---	---	2.00 11.00
3095	American Agricultural Chemical Co., New York, N. Y.	Zell's Bone and Potash.	Elkin.	11.82	---	---	---	---	1.84 12.48

3194	American Fertilizing Co., Norfolk, Va.....	Dissolved Bone and Potash for Corn and Wheat.....	Reidsville.....	9.85	2.06	10.86
3072	Armour Fertilizer Works, Greensboro, N. C.....	Armour's Phosphate and Potash Fertilizer.....	Concord.....	9.94	1.60	10.55
3361	Asheville Packing Co., Asheville, N. C.....	Asheville Packing Co.'s Special XXX Wheat Grower.....	Asheville.....	10.99	2.44	12.33
3359	Atlantic Fertilizer Co., Atlanta, Ga.....	Atlantic Acid Potash Mixture 10-2 Standard Grade.....	Hendersonville.....	9.68	2.98	11.69
3059	Baugh & Sons Co., Norfolk, Va.....	Baugh's Soluble Alkaline Superphosphate.....	Randleman.....	10.07	2.78	11.84
3327	Beta Fertilizer Co., Beta, N. C.....	Beta Special Grass and Grain Fertilizer.....	Sylva.....	10.60	1.44	10.98
3251	Bryant Fertilizer Co., Alexandria, Va.....	Bryant's Bone and Potash.....	Burlington.....	10.29	1.84	11.10
3303	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.....	Caraleigh Electric Bone and Potash Mixture.....	Troy.....	9.94	2.30	11.25
3248	Carolina Warehouse Co., Salisbury, N. C.....	Farmers' Union 10-2 Bone and Potash.....	Winston-Salem.....	10.61	2.42	11.97
3167	Conestee Chemical Co., Wilmington, N. C.....	Conestee Bone and Potash.....	Maiden.....	10.88	2.26	12.05
3178	Farmers Guano Co., Raleigh, N. C.....	Century Bone and Potash Mixture.....	Gold Hill.....	10.02	2.06	11.08
3208	Georgia Chemical Works, Augusta, Ga.....	Bone and Potash.....	Denton.....	9.84	1.96	10.62
3338	Hampton Guano Co., Norfolk, Va.....	Dauntless Potash Mixture.....	Maiden.....	10.90	2.06	11.87
3073	Imperial Co., Norfolk, Va.....	Virginia Grain Mixture.....	Davidson.....	10.70	2.18	11.81
3377	.....do.....	.....do.....	Seagrove.....	10.37	2.00	11.33
3159	Lee, A. S., & Sons Co., Richmond, Va.....	Lee's Wheat Fertilizer.....	Waco.....	10.07	1.90	10.96
3147	Lister's Agricultural Chemical Works, Newark, N. J.....	Lister's Phosphoric Acid and Potash.....	Rockwell.....	10.91	3.86	13.68
3272	Marietta Fertilizer Co., Greensboro, N. C.....	Marietta Dissolved Bone and Potash.....	Albemarle.....	10.08	1.96	11.03
3293	Patapsco Guano Co., Baltimore, Md.....	Patapsco Soluble Phosphate and Potash.....	Granite Quarry.....	10.37	2.24	11.57
3118	Pocahontas Guano Co., Lynchburg, Va.....	Carrington's Superior Grain Compound 10-2 Potash Mixture.....	Madison.....	12.07	2.18	13.04
3389	Pocomoke Guano Co., Norfolk, Va.....	Bone and Potash Mixture.....	Statesville.....	10.49	2.36	11.80
3227	Powhatan Chemical Co., Richmond, Va.....	Dissolved Bone with Potash.....	Mount Airy.....	10.02	2.00	11.02
3200	Navassa Guano Co., Wilmington, N. C.....	Level Run Dissolved Bone.....	Lawndale.....	10.03	1.96	10.99
3399	Robertson Fertilizer Co., Norfolk, Va.....	Royster's Bone and Potash Mixture.....	Mocksville.....	9.17	2.08	10.33
3131	Royster, F. S., Guano Co., Norfolk, Va.....	Swift's Wheat Grower Standard Grade Phosphate and Potash.....	North Wilkesboro.....	10.69	1.34	10.96
3306	Swift Fertilizer Works, Atlanta, Ga.....		Troy.....	9.53	2.04	10.62

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.					Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.		Potash.
MIXED FERTILIZERS.										
Brands claiming										
3207	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Bone and Potash.	Denton.	10.00					2.00	\$ 11.00
3137	do.	do.	Big Lick.	9.96					2.06	11.02
3349	United States Fertilizer Co., Baltimore, Md.	Farm Bell Alkaline Mixture.	Efand.	10.35					1.66	10.97
3183	Union Guano Co., Winston, N. C.	Union 10-2 Bone and Potash.	Norwood.	10.31					2.66	11.94
3234	Va.-Car. Chemical Co., Richmond, Va.	A. & A.'s McGavock's Special Potash Mixture.	Mount Airy.	10.32					2.62	11.90
3373	do.	A. & A.'s B. P. Potash Mixture.	Lexington.	10.40					2.28	11.64
3129	do.	Davie & Whittle's Owl Brand Acid Phosphate with Potash.	North Wilkesboro	10.11					1.86	10.96
3061	do.	Durham Fertilizer Co.'s Blue Ridge Wheat Grower.	Graves Siding.	11.02					2.62	12.54
3356	do.	do.	Asheville.	10.41					2.20	11.57
3100	do.	Durham Fertilizer Co.'s Standard Wheat Grower.	North Wilkesboro	13.75					1.00	13.37
3321	do.	Durham Fertilizer Co.'s Bone and Potash Mixture.	Hillsboro.	10.77					2.14	11.83
3411	do.	Lynchburg Guano Co.'s Dissolved Bone and Potash.	Elkin.	10.82					1.50	11.24
3080	do.	Old Dominion Guano Co.'s Alkaline Bone and Potash.	Trinity.	10.46					1.96	11.37
3222	do.	Southern Chemical Co.'s Mammoth Wheat Grower.	Maiden.	10.08					2.80	11.87
3119	do.	J. G. Tinsley & Co.'s Bone and Potash Mixture.	Winston-Salem.	10.00					1.92	10.72
3442	do.	S. W. Travers & Co.'s Capital Bone and Potash.	Pittsboro.	11.87					2.04	12.72
				10.25					2.20	11.42



## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.						Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	
MIXED FERTILIZERS.										
	Brands claiming			10.00						4.00
3201	Navassa Guano Co., Wilmington, N. C.	Navassa Dissolved Bone with Potash.	Shelby	9.94						3.80
3146	do.	Navassa Wheat and Grass Grower	Rockwell	10.55						5.00
3294	Patapasco Guano Co., Baltimore, Md.	Patapasco 10-4 Potash Mixture.	Granite Quarry	10.22						3.84
3457	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Farmers' Bone and Potash.	Reidsville	10.47						3.84
3190	Pocahontas Guano Co., Lynchburg, Va.	Wabash Wheat Mixture.	Roxboro.	10.15						3.32
3388	Powhatan Chemical Co., Richmond, Va.	Magie Bone and Potash Mixture.	Cornelius	10.43						5.18
3202	Richmond Guano Co., Richmond, Va.	Rex Bone and Potash Mixture.	Shelby	10.02						3.92
3078	Robertson Fertilizer Co., Norfolk, Va.	Skyscraper Bone and Potash Compound.	Glenola	9.66						3.56
3182	Royster, F. S., Guano Co., Norfolk, Va.	Royster's 10-4 Bone and Potash Mixture.	Faith	9.95						3.86
3075	Swift Fertilizer Works, Wilmington, N. C.	Swift's Farmers' Home High Grade.	Concord	10.25						4.26
3206	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Acid and Potash.	Denton	9.91						4.08
3181	do.	do.	Granite Quarry.	9.98						3.80
3422	do.	do.	Concord	10.04						3.38
3114	Union Guano Co., Winston, N. C.	Quaker Grain Mixture.	Greensboro.	10.33						3.92
3111	United States Fertilizer Co., Baltimore, Md.	Farm Bell Special Mixture.	Greensboro.	10.74						3.90
3160	Va.-Car. Chemical Co., Richmond, Va.	Old Dominion Obelisk Bone and Potash.	Iron.	12.09						3.70

3138	do	Southern Chemical Co.'s Winner Grain Mixture.	Salisbury	10.14	4.76	13.89
3390	do	do	Statesville	9.62	4.86	13.52
3193	do	V.-C. C. Co.'s Special Potash Mixture.	Roxboro	9.47	4.22	12.74
3099	do	Va. State Fertilizer Co.'s XX Potash Mixture.	North Wilkesboro	10.32	4.06	13.35
<b>Brands claiming</b>						
3148		Armour Fertilizer Works, Greensboro, N. C.	Albemarle	10.17	4.80	13.96
3312		Coöperative Warehouse Co., Salisbury, N. C.	Troutman	9.32	4.96	13.35
3271		Marietta Fertilizer Co., Greensboro, N. C.	Albemarle	10.29	4.74	14.00
3400		Peachontas Guano Co., Lynchburg, Va.	Mount Airy	14.12	1.80	14.51
3459		Rasin-Monumental Co., Baltimore, Md.	Durham	10.40	4.34	13.70
3436		Robertson Fertilizer Co., Norfolk, Va.	Walnut Cove	10.31	5.44	14.72
3283		Royster, F. S., Guano Co., Norfolk, Va.	Kernersville	9.99	4.28	13.27
3318		Union Guano Co., Winston, N. C.	Burlington	9.72	4.82	13.57
3113		United States Fertilizer Co., Baltimore, Md.	Greensboro	10.40	5.76	15.12
3346		Va.-Car. Chemical Co., Richmond, Va.	Burlington	9.96	4.60	13.56
3320	do	Va. State Fertilizer Co.'s Mountain Top Bone and Potash.	Hillsboro	9.67	5.32	14.02
<b>Brands claiming</b>						
3305		Coöperative Warehouse Co., Salisbury, N. C.	Salisbury	9.97	5.28	14.25
3421		Tidewater Guano Co., Norfolk, Va.	Concord	10.07	5.98	15.04
3071		Tuscarora Fertilizer Co., Greensboro, N. C.	Concord	10.11	5.84	14.94
3319		Union Guano Co., Winston, N. C.	Burlington	9.89	6.22	15.12
3254		Va.-Car. Chemical Co., Richmond, Va.	Burlington	9.68	5.24	13.95
<b>Brands claiming</b>						
3191		Patapasco Guano Co., Baltimore, Md.	Roxboro	12.19	4.16	15.13
3357		Va.-Car. Chemical Co., Richmond, Va.	Asheville	10.52	5.10	14.57

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.						Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.		
MIXED FERTILIZERS.											
Brands claiming											
3249	Baugh & Sons Co., Norfolk, Va.	Baugh's 12-5 Phosphate and Potash.	Guilford College.	12.00						5.00	\$ 15.80
3438	Carolina-Union Fertilizer Co., Norfolk, Va.	Carolina-Union 12-5.	Mount Airy.	11.61						5.98	16.23
3228	Powhatan Chemical Co., Richmond, Va.	High Grade Bone and Potash Mixture.	Mount Airy.	12.19						4.68	15.65
3237	Richmond Guano Co., Richmond, Va.	High Grade Bone and Potash.	Concord.	11.85						4.92	15.58
3235	Va.-Car. Chemical Co., Richmond, Va.	Goodman's Special Potash Mixture.	Concord.	12.45						4.87	16.07
Brands claiming											
3093	Armour Fertilizer Works, Greensboro, N. C.	Armour Phosphate and Potash Fertilizer.	Walnut Cove.	12.00						6.00	16.80
3304	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union 12-6 Bone and Potash.	Salisbury.	12.14						5.96	16.89
3458	Georgia Chemical Co., Augusta, Ga.	Georgia Bone and Potash.	Durham.	10.86						7.70	17.47
3233	Marietta Fertilizer Co., Greensboro, N. C.	Marietta Potash and Acid.	Mount Airy.	12.89						4.40	16.00
3231	Martin Fertilizer Co., Norfolk, Va.	Martin's Potash and Soluble Bone.	Pilot Mountain.	11.76						4.84	15.42
2437	do.	do.	Pilot Mountain.	12.14						5.50	16.43
3384	Swift Fertilizer Works, Wilmington, N. C.	Swift's Special High Grade Phosphate and Potash.	Newton.	11.29						5.92	16.08
3420	Tidewater Guano Co., Norfolk, Va.	Tidewater 12-6 Bone and Potash.	Concord.	10.75						7.20	16.87
3169	Union Guano Co., Winston, N. C.	Union 12-6 Bone and Potash.	Conover.	11.66						6.32	16.81
				11.52						5.08	15.45

3402	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Special High Grade Potash Mixture.	Ararat	11.88	7.10	17.79
	<b>Brand claiming</b>					
3330	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Concentrated Bone and Potash.	North Wilkesboro	20.00	4.00	22.00
	<b>Brand claiming</b>			19.75	4.14	21.91
3352	Va.-Car. Chemical Co., Richmond, Va.	Ground Tobacco Stems	Burlington		1.65 2.00	13.93
					1.91	15.04

## RAW OR UNMIXED FERTILIZER MATERIALS.

	<b>Brands claiming</b>			12.60		9.60
3353	Va.-Car. Chemical Co., Richmond, Va.	Old Dominion Guano Co.'s Royster's Acid Phosphate	Burlington	12.22		9.78
3121	do	J. G. Tinsley & Co.'s Acid Phosphate	Winston	13.77		11.10
3301	do	Travers & Co.'s Capitol Dissolved Bone	Winston	13.36		10.69
	<b>Brands claiming</b>			13.00		10.40
3062	American Fertilizer Co., Norfolk, Va.	Eagle Brand Acid Phosphate	Ether	13.90		11.12
3295	Etiwan Fertilizer Co., Charleston, S. C.	Diamond Soluble Bone	Salisbury	14.37		11.50
3212	Georgia Chemical Works, Augusta, Ga.	Dissolved Bone Phosphate	Denton	15.04		12.03
3404	Robertson Fertilizer Co., Norfolk, Va.	Acid Phosphate	Mocksville	13.31		10.65
3122	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Dissolved Bone	Mocksville	13.24		10.59
3300	Swift Fertilizer Works, Wilmington, N. C.	Swift's Harrow Standard Grade Acid Phosphate	North Wilkesboro	13.14		10.51
3412	Union Guano Co., Winston, N. C.	Union Dissolved Bone	North Wilkesboro	13.24		10.59
3274	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's I. X. L. Acid Phosphate	Lexington	13.02		10.42
3087	do	Davie & Whittle's Owl Brand Acid Phosphate	Newsom	13.24		10.59
3323	do	Durham Fertilizer Co.'s Double Bone Phosphate	Hillsboro	13.96		11.17
	<b>Brands claiming</b>			14.00		11.20
3391	American Agricultural Chemical Co., New York, N. Y.	Zell's 14 Per Cent Acid Phosphate	Statesville	15.12		12.10
3354	Armour Fertilizer Works, Greensboro, N. C.	Armour's Star Phosphate	Hillsboro	14.59		11.67
3171	Conestee Chemical Co., Wilmington, N. C.	Conestee High Grade Acid Phosphate	Maiden	14.14		11.31

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition of Parts per 100.					Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	
RAW OR UNMIXED FERTILIZER MATERIALS.									
	Brands claiming.....			14.00					\$ 11.20
3215	Georgia Chemical Co., Augusta, Ga.....	Extra Dissolved Bone Phosphate.....	Denton.....	14.60					11.68
3313	Patapsco Guano Co., Baltimore, Md.....	Patapsco Pure Dissolved Phosphate.....	Statesville.....	15.56					12.45
3328	Pocomoke Guano Co., Norfolk, Va.....	Peerless Acid Phosphate.....	Sylva.....	16.77					13.42
3303	Richmond Guano Co., Richmond, Va.....	High Grade Acid Phosphate.....	Shelby.....	13.73					10.98
3064	Royster, F. S., Guano Co., Norfolk, Va.....	Royster's 14 Per Cent Acid Phosphate.....	Seagrove.....	13.34					10.67
3066	Union Guano Co., Winston, N. C.....	Union High Grade Acid Phosphate.....	Graves Siding.....	13.36					10.69
3222	Va.-Car. Chemical Co., Richmond, Va.....	Allison & Addison's Acid Phosphate.....	Hillsboro.....	15.07					12.06
3275	do.....	Allison & Addison's Fulton Acid Phosphate.....	Lexington.....	15.24					12.19
3086	do.....	Davie & Whittle's Owl Brand High Grade Dissolved Bone.....	Newsom.....	14.09					11.27
3378	do.....	Southern Chemical Co.'s Red Cross Acid Phosphate.....	Seagrove.....	14.20					11.36
	Brands claiming.....			16.00					12.80
3333	Acme Mfg. Co., Wilmington, N. C.....	16 Per Cent Acid Phosphate.....	Mount Olive.....	17.74					14.19
3076	American Agricultural Chemical Co., New York, N. Y.....	Zell's 16 Per Cent Acid Phosphate.....	Davidson.....	16.66					13.33
3195	American Fertilizing Co., Norfolk, Va.....	American High Grade Acid Phosphate.....	Reidsville.....	16.99					13.59
3264	Armour Fertilizer Works, Greensboro, N. C.....	Armour's 16 Per Cent Acid Phosphate.....	Sanford.....	16.00					12.80
3229	Asheville Packing Co., Asheville, N. C.....	Asheville Packing Co.'s High Grade Acid Phosphate.....	Asheville.....	17.55					14.04

3276	Atlantic Fertilizer Co., Atlanta, Ga.	Atlantic Acid Phosphate	Albemarle	16.20					12.96
3141	Baugh & Sons Co., Norfolk, Va.	Baugh's 16 Per Cent Acid Phosphate	Big Lick	14.72					11.78
3308	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh 16 Per Cent Acid Phosphate	Troy	16.44					13.15
3140	Carolina Warehouse Co., Salisbury, N. C.	Farmers' Union 16 Per Cent Acid Phosphate	Salisbury	16.44					13.15
3214	Carolina-Union Fertilizer Co., Norfolk, Va.	Carolina-Union 16 Per Cent Acid Phosphate	Denton	16.47					13.18
3223	Columbia Guano Co., Norfolk, Va.	Columbia High Grade 16 Per Cent Acid Phosphate	Conover	16.36					13.09
3172	Conestee Chemical Co., Wilmington, N. C.	16 Per Cent Acid Phosphate	Maiden	17.40					13.92
3396	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union 16 Per Cent Acid Phosphate	Newton	16.48					13.18
3184	Farmers Guano Co., Raleigh, N. C.	16 Per Cent Acid Phosphate	Gold Hill	16.79					13.43
3211	Georgia Chemical Works, Augusta, Ga.	High Grade Dissolved Bone Phosphate	Denton	15.09					12.07
3340	Hampton Guano Co., Norfolk, Va.	Supreme Acid Phosphate	Maiden	17.18					13.74
3063	Imperial Co., Norfolk, Va.	High Grade Tennessee Acid Phosphate	Ether	16.10					12.88
3077	Interstate Chemical Corporation, Charlotte, N. C.	Acid Phosphate	Huntersville	16.03					12.82
3150	Lister's Agricultural Chemical Works, Newark, N. J.	Lister's High Grade Acid Phosphate	Rockwell	16.87					13.50
3237	Marietta Fertilizer Co., Greensboro, N. C.	Marietta Acid Phosphate	Mount Airy	16.00					12.80
3296	Martin, D. B., Co., Norfolk, Va.	Martin's Acid Phosphate	Salisbury	16.34					13.07
3265	Navassa Guano Co., Wilmington, N. C.	Navassa 16 Per Cent Acid Phosphate	Goldston	15.93					12.74
3297	Patasco Guano Co., Baltimore, Md.	Florida Soluble Phosphate	Gold Hill	16.49					13.19
3371	Pearsall & Co., Wilmington, N. C.	Pearsall's 6 Per Cent Acid Phosphate	Lumberton	15.94					12.75
3460	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont 16 Per Cent Acid Phosphate	Reidsville	17.37					13.90
3088	Pocahontas Guano Co., Lynchburg, Va.	Carrington's S. C. Phosphate, Waukesha Brand	Trinity	16.73					13.38
3341	Pocomoke Guano Co., Norfolk, Va.	Superb Acid Phosphate	Maiden	15.82					12.66
3236	Powhatan Chemical Co., Richmond, Va.	Magic Dissolved Bone Phosphate	Mount Airy	16.20					12.96
3170	Rasin-Monumental Co., Baltimore, Md.	Rasin Acid Phosphate	Newton	15.21					12.17
3132	Richmond Guano Co., Richmond, Va.	Rex Dissolved Bone	North Wilkesboro	16.67					13.34
3426	Robertson Fertilizer Co., Norfolk, Va.	High Grade Acid Phosphate	Kings Mountain	17.44					13.95

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.					Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	
RAW OR UNMIXED FERTILIZER MATERIALS.									
Brands claiming-----				16.00	-----	-----	-----	-----	\$ 12.80
3173	Royster, F. S., Guano Co., Norfolk, Va.....	Royster's High Grade 16 Per Cent Acid Phosphate.	Newton.....	16.35	-----	-----	-----	-----	13.08
3307	Swift Fertilizer Works, Atlanta, Ga.....	Swift's Special High Grade Acid Phosphate.	Troy.....	17.27	-----	-----	-----	-----	13.82
3423	Tidewater Guano Co., Norfolk, Va.....	Top Rail Acid Phosphate.	Concord.....	15.99	-----	-----	-----	-----	12.79
3213	Tuscarora Fertilizer Co., Greensboro, N. C.....	Tuscarora Acid Phosphate	Denton.....	17.15	-----	-----	-----	-----	13.72
3149	do.....	do.....	Albemarle.....	16.37	-----	-----	-----	-----	13.10
3355	United States Fertilizer Co., Baltimore, Md.....	Farm Bell Acid Phosphate.....	Efland.....	16.02	-----	-----	-----	-----	12.82
3115	Union Guano Co., Winston, N. C.....	Union 16 Per Cent Acid Phosphate.....	Greensboro.....	15.01	-----	-----	-----	-----	12.01
3204	Venable Fertilizer Co., Richmond, Va.....	Venable's Best Acid Phosphate.....	Kings Mountain.....	15.64	-----	-----	-----	-----	12.51
3161	Va.-Car. Chemical Co., Richmond, Va.....	Davie & Whittle's Owl Brand High Grade Acid Phosphate.	Rutherfordton.....	17.21	-----	-----	-----	-----	13.77
3405	do.....	Durham Fertilizer Co.'s Best Acid Phosphate.	Mocksville.....	16.10	-----	-----	-----	-----	12.88
3224	do.....	Southern Chemical Co.'s Comet 16 Per Cent Acid Phosphate.	Maiden.....	16.50	-----	-----	-----	-----	13.20
3101	do.....	Travers & Co.'s Acid Phosphate.....	North Wilkesboro	15.55	-----	-----	-----	-----	12.44
3162	do.....	V.-C. C. Co.'s 16 Per Cent Acid Phosphate.	Iron Station.....	17.16	-----	-----	-----	-----	13.73
3120	do.....	Va. State Fertilizer Co.'s Bull Run Acid Phosphate.	Winston.....	15.92	-----	-----	-----	-----	12.74
Brands claiming-----				24.00	-----	-----	-----	-----	19.20
3413	Union Guano Co., Winston, N. C.....	Special Mixture.....	Elkin.....	21.26	-----	-----	-----	-----	17.01

3133	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Concentrated Acid Phosphate.	North Wilkesboro	23.76	19.01
	Brand claiming				
3151	Lee, A. S., & Sons Co., Richmond, Va.	Lee's Prepared Agricultural Lime.	Albemarle	2.25	1.80
	Brand claiming			2.54	2.03
3309	Union Fertilizer Co., Norfolk, Va.	Genuine German Kainit.	Mount Gilead	12.00	9.60
	Brand claiming			13.92	11.14
3321	Tuscarora Fertilizer Co., Greensboro, N. C.	Muriate of Potash.	Denton	50.00	40.00
				50.96	40.76

## BRANDS REGISTERED—SEASON 1914.

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
<i>Acme Manufacturing Co., Wilmington, N. C.—</i>			
16 Per Cent Acid Phosphate.....	16.00	....	....
Acme High Grade Acid Phosphate.....	14.00	....	....
Acme Bone and Potash.....	12.00	....	6.00
Acme Bone and Potash.....	12.00	....	5.00
Acme Bone and Potash.....	12.00	....	4.00
Acme Bone and Potash.....	12.00	....	3.00
Acme Bone and Potash.....	12.00	....	2.00
Acme Bone and Potash.....	11.00	....	6.00
Acme Bone and Potash.....	11.00	....	5.00
Acme Bone and Potash.....	11.00	....	4.00
Acme Bone and Potash.....	11.00	....	3.00
Acme Bone and Potash.....	11.00	....	2.00
Acme Melon Grower .....	10.00	3.30	5.00
Acme Bone and Potash.....	10.00	....	6.00
Acme Bone and Potash.....	10.00	....	5.00
Acme Bone and Potash.....	10.00	....	4.00
Acme Bone and Potash.....	10.00	....	3.00
Acme Bone and Potash.....	10.00	....	2.00
Acme Square Deal Fertilizer .....	9.25	1.65	2.00
Acme Square Deal Fertilizer for Tobacco....	9.25	1.65	2.00
Acme Cotton Grower .....	9.00	2.27	2.00
Acme Premo Guano .....	9.00	.82	3.00
Pumpelly's Special Tobacco Fertilizer.....	8.00	4.12	8.00
Acme Special Fertilizer for Cotton.....	8.00	4.12	7.00
Acme Special Fertilizer for Tobacco.....	8.00	4.12	7.00
B. & C. Co.'s Special Fertilizer.....	8.00	3.30	6.00
Acme Plumb Good Fertilizer .....	8.00	3.30	6.00
Acme Plumb Good Fertilizer for Tobacco....	8.00	3.30	6.00
Acme "OK" Fertilizer .....	8.00	3.30	4.00
Acme "OK" Fertilizer for Tobacco.....	8.00	3.30	4.00
Quick Step Fertilizer .....	8.00	3.30	4.00
Quick Step Fertilizer for Tobacco.....	8.00	3.30	4.00
Acme Crop Grower .....	8.00	2.47	4.00
Currie's High Grade Fertilizer .....	8.00	2.47	4.00
Acme Crop Grower for Tobacco.....	8.00	2.47	4.00
Best's Fish Scrap Guano for Tobacco.....	8.00	2.47	3.00
Best's Fish Scrap Guano .....	8.00	2.47	3.00
Pee Dee Special Fertilizer .....	8.00	2.47	3.00
Pee Dee Special for Tobacco.....	8.00	2.47	3.00
Acme 8-3-3 C. S. M. Guano.....	8.00	2.47	3.00
Acme 8-3-3 C. S. M. Guano for Tobacco....	8.00	2.47	3.00
Acme Plant Food .....	8.00	2.47	2.50
Acme Fertilizer for Tobacco .....	8.00	2.47	2.50
Acme Plant Food for Tobacco.....	8.00	2.47	2.50
Acme Fertilizer .....	8.00	2.47	2.50
Acme Merito Mixture .....	8.00	2.06	4.00
Tip Top Crop Grower .....	8.00	2.06	3.00
Tip Top Tobacco Grower .....	8.00	2.06	3.00
Latimer's Complete Fertilizer .....	8.00	2.06	2.00
Acme Standard Guano .....	8.00	2.06	2.00
Best's Complete Fertilizer .....	8.00	2.06	2.00
Cotton-seed Meal Guano .....	8.00	1.65	2.00
Gem Fertilizer .....	8.00	1.65	2.00
Cotton-seed Meal Guano for Tobacco.....	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Gem Fertilizer for Tobacco .....	8.00	1.65	2.00
Acme Special Grain Fertilizer .....	8.00	1.65	2.00
Acme Bone and Potash.....	8.00	....	6.00
Acme Bone and Potash.....	8.00	....	5.00
Acme Bone and Potash.....	8.00	....	4.00
Acme Root Crop Guano .....	7.00	4.12	7.00
Acme Standard Truck Guano.....	7.00	4.12	5.00
Jefferson Cotton Grower .....	7.00	2.47	4.00
Acme High Grade Guano .....	6.00	4.94	8.00
Acme Truck Grower .....	6.00	3.30	8.00
Acme Corn Guano .....	6.00	2.47	3.00
Dried Ground Fish .....	4.50	7.81	....
Acme Special 4-10-4 Guano .....	4.00	8.25	4.00
Clark's Corn Guano .....	1.00	6.58	10.00
Sulphate of Ammonia .....	....	20.56	....
Nitrate of Soda .....	....	14.81	....
Dried Ground Blood .....	....	11.51	....
Acme Top Dresser .....	....	7.40	3.00
Cotton-seed Meal .....	....	6.17	....
Cotton-seed Meal .....	....	6.17	....
Sulphate of Potash .....	....	....	48.00
Muriate of Potash .....	....	....	48.00
High Grade German Kainit 16 Per Cent.....	....	....	16.00
Genuine German Kainit .....	....	....	12.00

*American Agricultural Chemical Co., Baltimore,  
Greensboro, and New York—*

A. A. C. Co.'s 16 Per Cent Superphosphate...	16.00	....	....
Canton Chemical 16 Per Cent Acid Phosphate.	16.00	....	....
Detrick's 16 Per Cent Acid Phosphate.....	16.00	....	....
Lazaretto 16 Per Cent Acid Phosphate.....	16.00	....	....
Zell's 16 Per Cent Acid Phosphate.....	16.00	....	....
Lazaretto 14 Per Cent Acid Phosphate.....	14.00	....	....
Canton Chemical 14 Per Cent Acid Phosphate.	14.00	....	....
Detrick's XXtra Acid Phosphate.....	14.00	....	....
Zell's 14 Per Cent Acid Phosphate.....	14.00	....	....
Zell's 13 Per Cent Acid Phosphate.....	13.00	....	....
Detrick's H. G. Bone and Potash.....	12.00	....	5.00
Zell's H. G. Bone and Potash.....	12.00	....	5.00
Zell's Sterling High Grade .....	10.00	3.29	4.00
Lazaretto Sure Crop Compound.....	10.00	3.29	4.00
Champion Cotton Fertilizer .....	10.00	2.47	3.00
Excelsior Alkaline Bone .....	10.00	....	5.00
Zell's H. G. Bone and Potash.....	10.00	....	4.00
Canton Chemical Soluble Phosphate and Pot- ash .....	10.00	....	4.00
Lazaretto H. G. Alkaline Bone.....	10.00	....	4.00
Zell's Bone and Potash .....	10.00	....	2.00
Lazaretto Alkaline Bone .....	10.00	....	2.00
Detrick's Bone and Potash .....	10.00	....	2.00
Canton Chemical Soluble Phosphate and Pot- ash .....	10.00	....	2.00
A. A. C. Co.'s Top Notch Special.....	9.00	2.47	7.00
Zell's Royal High Grade Fertilizer.....	9.00	2.06	2.00
Detrick's Superior Animal Bone Fertilizer...	9.00	1.85	4.00
Canton Chemical Animal Bone Fertilizer....	9.00	1.85	4.00
Zell's Victoria Animal Bone Compound.....	9.00	1.85	4.00
Lazaretto Retriever Animal Bone Fertilizer.	9.00	1.85	4.00
Zell's Empire Cotton Compound.....	9.00	1.65	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Zell's Hustler Phosphate .....	9.00	.82	3.00
Mogul Fertilizer .....	9.00	.82	3.00
Pacific Guano for Tobacco .....	8.50	2.47	2.50
Reese's Potato and Truck Special.....	8.00	3.29	7.00
Zell's Popular Tobacco Manure.....	8.00	3.29	4.00
Detrick's Kangaroo Komplete Kompound Special High Grade .....	8.00	3.29	4.00
Lazaretto Carolina Cotton Food.....	8.00	3.29	4.00
A. A. C. Co.'s Palmetto C. S. M. Compound..	8.00	3.29	4.00
Canton Chemical Bono Tobacco Fertilizer...	8.00	3.29	4.00
Zell's Economizer Cotton Food .....	8.00	3.29	4.00
A. A. C. Co.'s Excelsior Compound for Tobacco .....	8.00	2.47	5.00
Detrick's Gold Eagle Cotton Compound.....	8.00	2.47	4.00
Detrick's Kangaroo Komplete Kompound for Tobacco .....	8.00	2.47	4.00
Lazaretto King of the Harvest.....	8.00	2.47	4.00
Zell's Tobacco Fertilizer .....	8.00	2.47	4.00
Canton Chemical Homestead Protector.....	8.00	2.47	4.00
Canton Chemical Gladiator Cotton Fertilizer.	8.00	2.47	3.00
A. A. C. Co.'s Eureka Cotton-seed Meal Compound .....	8.00	2.47	3.00
Detrick's Special Tobacco Fertilizer.....	8.00	2.47	3.00
Canton Chemical Baker's Tobacco Fertilizer.	8.00	2.47	3.00
Canton Chemical Superior High Grade Fertilizer .....	8.00	2.47	3.00
Detrick's Victory Cotton Fertilizer.....	8.00	2.47	3.00
Detrick's Kangaroo Komplete Kompound Bright Tobacco Grower .....	8.00	2.47	3.00
Lazaretto Carolina Tobacco Fertilizer.....	8.00	2.47	3.00
Detrick's Kangaroo Komplete Kompound for Cotton .....	8.00	2.47	3.00
Zell's Bright Tobacco Grower .....	8.00	2.47	3.00
Zell's Reliance High Grade Manure.....	8.00	2.47	3.00
Lazaretto New Rival Cotton Fertilizer.....	8.00	2.47	3.00
Lazaretto Special Tobacco and Potato Fertilizer .....	8.00	2.47	3.00
Lazaretto Challenge Fertilizer .....	8.00	2.47	3.00
Canton Chemical CCC Special Compound....	8.00	2.06	6.00
Detrick's Vegetator Ammoniated Superphosphate .....	8.00	2.06	3.00
Zell's "Square Deal" for Tobacco.....	8.00	2.06	3.00
Slingluff's British Mixture .....	8.00	2.06	2.50
Excelsior Bone Compound .....	8.00	1.65	5.00
Square Deal Phosphate .....	8.00	1.65	4.00
Savage, Son & Co.'s Brand Purity Guano....	8.00	1.65	2.00
Dawson's Crop Maker .....	8.00	1.65	2.00
Triumph Soluble Guano .....	8.00	1.65	2.00
Canton Chemical Baker's Fish Guano.....	8.00	1.65	2.00
Canton Chemical Game Guano .....	8.00	1.65	2.00
Detrick's Royal Crop Grower.....	8.00	1.65	2.00
Detrick's Fish Mixture .....	8.00	1.65	2.00
Lazaretto Crop Grower .....	8.00	1.65	2.00
Zell's Special Compound for Tobacco.....	8.00	1.65	2.00
Zell's Calvert Guano .....	8.00	1.65	2.00
Zell's Fish Guano .....	8.00	1.65	2.00
Reese's Pacific Guano .....	8.00	1.65	2.00
Detrick's Rival Tobacco Compound .....	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Detrick's Complete Compound for Grain and Grass .....	8.00	1.03	4.00
The A. A. C. Co. Fidelity Grain Grower.....	8.00	.82	4.00
Lazaretto Peanut Grower .....	8.00	.82	4.00
A. A. C. Co.'s Regal Crop Grower.....	8.00	.82	3.00
Palmetto Alkaline Phosphate .....	8.00	....	4.00
Lazaretto Early Trucker .....	7.00	4.11	5.00
A. A. C. Co.'s Blood, Bone and Fish Com- -pound .....	7.00	3.29	5.00
Lazaretto Truckers' Favorite .....	6.00	5.76	5.00
Lazaretto Empire Trucker .....	6.00	4.11	7.00
A. A. C. Co.'s Nitrate of Soda.....	....	15.00	....
A. A. C. Co.'s Baltimore Top Dresser.....	....	7.41	3.00
A. A. C. Co.'s Muriate of Potash.....	....	....	49.00
A. A. C. Co.'s Genuine German Kainit.....	....	....	12.00

*American Agricultural Chemical Co., Dixie Guano  
Branch, Spartanburg, S. C.—*

Dixie Acid Phosphate .....	16.00	....	....
Dixie Acid Phosphate .....	14.00	....	....
Dixie Bone and Potash .....	13.00	....	6.00
Dixie Bone and Potash .....	12.00	....	6.00
Dixie Fertilizer .....	10.00	3.30	4.00
Dixie Fertilizer .....	10.00	3.30	2.00
Dixie Fertilizer .....	10.00	2.47	4.00
Dixie Fertilizer .....	10.00	2.47	3.00
Dixie Blood, Bone and Potash.....	10.00	2.47	2.00
Dixie Money Maker Fertilizer .....	10.00	1.85	3.00
Dixie Blood, Bone and Potash .....	10.00	1.65	8.00
Dixie Fertilizer .....	10.00	1.65	4.00
Dixie Cotton Grower .....	10.00	1.65	3.00
Dixie Fertilizer .....	10.00	1.65	2.00
Dixie Grain Grower .....	10.00	.82	5.00
Dixie Bone and Potash .....	10.00	....	6.00
Dixie Bone and Potash .....	10.00	....	4.00
Dixie Bone and Potash .....	10.00	....	2.00
Dixie Beats All Fertilizer .....	9.20	1.65	2.00
Dixie Fertilizer .....	9.00	2.47	3.00
Dixie Fertilizer .....	9.00	2.47	2.00
Dixie Blood and Bone .....	9.00	1.65	3.00
Dixie Fertilizer .....	9.00	1.65	2.00
Dixie Fertilizer .....	8.00	4.12	7.00
Dixie Fertilizer .....	8.00	3.30	8.00
Dixie Fertilizer .....	8.00	3.30	4.00
Dixie Farmers' Favorite .....	8.00	2.47	3.00
Dixie Corn Grower .....	8.00	1.65	5.00
Dixie Special Corn Mixture .....	8.00	1.65	4.00
Dixie Bone and Potash .....	8.00	....	4.00
Dixie Potato Fertilizer .....	7.00	3.30	5.00
Dixie Lawn Grower .....	7.00	2.47	4.00
Dixie Special Garden Grower .....	7.00	2.47	4.00
Dixie Top Dresser .....	5.00	5.77	3.00

*American Agricultural Chemical Co., Farmers Fer-  
tilizer Works, Spartanburg, S. C.—*

Red Rooster Acid Phosphate.....	16.00	....	....
Red Rooster Acid Phosphate.....	14.00	....	....
Red Rooster Bone and Potash.....	13.00	....	6.00

Name and Address of Manufacturer and Name of Brand.	Avall. Phos. Acid.	Nitrogen.	Potash.
Red Rooster Bone and Potash.....	12.00	....	6.00
Red Rooster Fertilizer .....	10.00	3.30	4.00
Red Rooster Fertilizer .....	10.00	3.30	2.00
Red Rooster Fertilizer .....	10.00	3.30	....
Red Rooster Fertilizer .....	10.00	2.47	4.00
Red Rooster Fertilizer .....	10.00	2.47	3.00
Red Rooster Blood, Bone and Potash.....	10.00	2.47	2.00
Red Rooster Money Maker Fertilizer .....	10.00	1.85	3.00
Red Rooster Blood, Bone and Potash Fertilizer .....	10.00	1.65	8.00
Red Rooster Fertilizer .....	10.00	1.65	4.00
Red Rooster Cotton Grower .....	10.00	1.65	3.00
Red Rooster Fertilizer .....	10.00	1.65	2.00
Red Rooster Grain Grower .....	10.00	.82	5.00
Red Rooster Bone and Potash .....	10.00	....	6.00
Red Rooster Bone and Potash .....	10.00	....	4.00
Red Rooster Bone and Potash .....	10.00	....	2.00
Red Rooster Fertilizer .....	9.00	2.47	3.00
Red Rooster Fertilizer .....	9.00	2.47	2.00
Red Rooster Blood and Bone .....	9.00	1.65	3.00
Red Rooster Beats All Fertilizer .....	9.00	1.65	2.00
Red Rooster Fertilizer .....	8.00	4.12	7.00
Red Rooster Fertilizer .....	8.00	3.30	8.00
Red Rooster Fertilizer .....	8.00	3.30	4.00
Red Rooster Farmers' Favorite Fertilizer...	8.00	2.47	3.00
Red Rooster Fertilizer .....	8.00	2.06	1.00
Red Rooster Corn Grower .....	8.00	1.65	5.00
Red Rooster Special Corn Mixture .....	8.00	1.65	4.00
Red Rooster Fertilizer .....	8.00	1.65	2.00
Top Notch C. S. M. Compound.....	8.00	1.65	2.00
Red Rooster Bone and Potash .....	8.00	....	4.00
Red Rooster Potato Fertilizer .....	7.00	3.30	5.00
Red Rooster Special Garden Grower.....	7.00	2.47	4.00
Red Rooster Lawn Grower .....	7.00	2.47	4.00
Red Rooster Top Dresser .....	5.00	5.75	3.00

*American Agricultural Chemical Co., Homestead  
Fertilizer Branch, Spartanburg, S. C.—*

Homestead Acid Phosphate .....	16.00	....	....
Homestead Acid Phosphate .....	14.00	....	....
Homestead Bone and Potash .....	13.00	....	6.00
Homestead Bone and Potash .....	12.00	....	6.00
Homestead Fertilizer .....	10.00	3.30	4.00
Homestead Fertilizer .....	10.00	3.30	2.00
Homestead Fertilizer .....	10.00	2.47	4.00
Homestead Fertilizer .....	10.00	2.47	3.00
Homestead Blood, Bone and Potash.....	10.00	2.47	2.00
Homestead Money Maker Fertilizer .....	10.00	1.85	3.00
Homestead Blood, Bone and Potash.....	10.00	1.65	8.00
Homestead Fertilizer .....	10.00	1.65	4.00
Homestead Cotton Grower .....	10.00	1.65	3.00
Homestead Fertilizer .....	10.00	1.65	2.00
Homestead Grain Grower .....	10.00	.82	5.00
Homestead Bone and Potash .....	10.00	....	6.00
Homestead Bone and Potash .....	10.00	....	4.00
Homestead Bone and Potash .....	10.00	....	2.00
Homestead Beats All Fertilizers .....	9.20	1.65	2.00
Homestead Fertilizer .....	9.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Homestead Fertilizer .....	9.00	2.47	2.00
Homestead Blood and Bone .....	9.00	1.65	3.00
Homestead Fertilizer .....	8.00	4.12	7.00
Homestead Fertilizer .....	8.00	3.30	8.00
Homestead Fertilizer .....	8.00	3.30	4.00
Homestead Farmers' Favorite .....	8.00	2.47	3.00
Homestead Fertilizer .....	8.00	2.06	1.00
Homestead Corn Grower .....	8.00	1.65	5.00
Homestead Special Corn Mixture .....	8.00	1.65	4.00
Homestead Fertilizer .....	8.00	1.65	2.00
Homestead Bone and Potash .....	8.00	....	4.00
Homestead Potato Fertilizer .....	7.00	3.30	5.00
Homestead Special Garden Grower .....	7.00	2.47	4.00
Homestead Lawn Grower .....	7.00	2.47	4.00
Homestead Top Dresser .....	5.00	5.77	3.00

*American Fertilizer Co., Norfolk, Va.—*

American Nonpareil Tobacco Grower.....	8.00	3.29	4.00
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*The Armour Fertilizer Works, Atlanta, Chicago,  
Wilmington, and Greensboro—*

Bone Meal .....	Total	24.00	2.47	....
Armour's Raw Bone Meal .....	Total	22.00	3.70	....
17 Per Cent Acid Phosphate.....		17.00	....	....
16 Per Cent Acid Phosphate.....		16.00	....	....
Star Phosphate 14 Per Cent.....		14.00	....	....
Acid Phosphate .....		14.00	....	....
Golden Grain Grower .....		13.00	....	4.00
13 Per Cent Acid Phosphate.....		13.00	....	....
Phosphate and Potash .....		12.00	....	6.00
Phosphate and Potash .....		12.00	....	5.00
12 Per Cent Acid Phosphate.....		12.00	....	....
Fertilizer, No. 1134 .....		11.00	2.47	4.00
Sampson Corn Mixture .....		11.00	....	5.00
Fertilizer, No. 1045.....		10.00	3.30	5.00
Fertilizer, No. 1044.....		10.00	3.30	4.00
Fertilizer, No. 1033.....		10.00	2.47	3.00
Fertilizer, No. 1025.....		10.00	1.65	5.00
Fertilizer, No. 1023.....		10.00	1.65	3.00
Armour's Wheat Grower .....		10.00	1.65	2.00
Ammoniated Dissolved Bone and Potash..		10.00	1.65	2.00
Special Mixture .....		10.00	1.03	6.00
Phosphate and Potash .....		10.00	....	6.00
Phosphoric Acid and Potash.....		10.00	....	5.00
Superphosphate and Potash .....		10.00	....	4.00
Acid and Potash .....		10.00	....	3.00
Phosphate and Potash, No. 1.....		10.00	....	2.00
Armour's Tobacco Champion .....		9.00	2.47	3.00
African Cotton Grower .....		9.00	2.47	3.00
Johnson's High Grade .....		9.00	2.05	5.00
Forsyth County Tobacco Special .....		9.00	2.05	3.00
Armour's Bright Tobacco Grower.....		9.00	1.65	3.00
Bone and Dissolved Bone with Potash.....		9.00	1.65	3.00
Fertilizer, No. 913 .....		9.00	.82	3.00
Armour's Phosphate and Potash.....		9.00	....	3.00
Tobacco Fertilizer .....		8.50	1.65	2.00
Standard Cotton Grower .....		8.50	1.65	2.00
Bone, Blood and Potash .....		8.00	4.11	7.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Young's Special .....	8.00	4.11	3.00
Van Lindley's Special .....	8.00	4.11	2.00
Fertilizer, No. 846 .....	8.00	3.30	6.00
Fertilizer, No. 844 .....	8.00	3.30	4.00
Special Trucker .....	8.00	3.30	4.00
Truck and Berry Special .....	8.00	2.47	10.00
Armour's S36 for Tobacco .....	8.00	2.47	6.00
Fertilizer, No. 836 .....	8.00	2.47	6.00
Special for Tobacco .....	8.00	2.47	5.00
Fertilizer, No. 835 .....	8.00	2.47	5.00
Fertilizer, No. 834 .....	8.00	2.47	4.00
Fertilizer, No. 833 .....	8.00	2.47	3.00
Underwood's Favorite .....	8.00	2.47	3.00
Cotton Special .....	8.00	2.47	3.00
Tobacco Special .....	8.00	2.47	3.00
Fertilizer, No. 832 .....	8.00	2.47	2.00
Berry King .....	8.00	2.05	4.00
Gold Medal for Tobacco .....	8.00	2.05	3.00
Sweet Potato Special .....	8.00	2.05	3.00
Champion .....	8.00	2.05	2.50
King Cotton .....	8.00	2.05	2.00
Slate's Tobacco Special .....	8.00	1.85	4.00
High Grade Potato .....	8.00	1.65	10.00
Fruit and Root Crop Special.....	8.00	1.65	5.00
Stokes & Co. Tobacco Special.....	8.00	1.65	5.00
Fertilizer, No. 825 .....	8.00	1.65	5.00
Fertilizer, No. 824 .....	8.00	1.65	4.00
Fertilizer, No. 823 .....	8.00	1.65	3.00
Carolina Cotton Special .....	8.00	1.65	3.00
Slaughter House for Tobacco .....	8.00	1.65	2.00
Armour's Slaughter House Fertilizer.....	8.00	1.65	2.00
General .....	8.00	1.65	2.00
Fertilizer, No. 815 .....	8.00	.82	5.00
Fertilizer, No. 814 .....	8.00	.82	4.00
Fertilizer, No. 813 .....	8.00	.82	3.00
Phosphate and Potash, No. 2.....	8.00	....	5.00
Phosphate and Potash, No. 3.....	8.00	....	4.00
Fertilizer, No. 758 .....	7.00	4.11	8.00
7 Per Cent Trucker .....	6.00	5.76	5.00
5 Per Cent Trucker .....	6.00	4.11	7.00
Manure Substitute .....	6.00	3.30	4.00
Armour's Velvet Leaf .....	6.00	2.47	7.00
10 Per Cent Trucker .....	5.00	8.23	3.00
Top Dresser .....	5.00	8.23	2.00
Armour's Top Dresser .....	4.00	6.18	2.50
Special Formula for Tobacco .....	4.00	3.30	5.00
Harvey's Special .....	4.00	3.30	4.00
Harris Electric Top Dresser .....	2.00	8.23	3.00
Armour's Top Dresser .....	....	7.83	4.00
Armour's Top Dresser .....	....	7.40	3.00
Sulphate of Ammonia .....	....	20.00	....
Nitrate of Soda .....	....	14.81	....
Blood .....	....	13.16	....
10 Per Cent Tankage .....	....	8.23	....
Cotton-seed Meal .....	....	6.18	....
Sulphate of Potash .....	....	....	50.00
Muriate of Potash .....	....	....	50.00
Kainit .....	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
<i>Geo. L. Arps &amp; Co., Norfolk, Va.—</i>			
Arps' H. G. 16 Per Cent Acid Phosphate.....	16.00	....	....
14 Per Cent Acid Phosphate.....	14.00	....	....
Arps' 10 and 4 Bone and Potash Mixture....	10.00	....	4.00
Arps' 10 and 2 Bone and Potash Mixture....	10.00	....	2.00
Arps' "Go-a-Head" Guano for Trucks, Cotton and Tobacco .....	8.00	3.30	4.00
Arps' Quick Growth for All Crops.....	8.00	2.47	3.00
Arps' Premium Guano for Cotton, Tobacco, and All Spring Crops .....	8.00	1.65	2.00
Arps' Big Yield Guano .....	8.00	1.65	2.00
Arps' Standard Truck Guano .....	7.00	4.12	5.00
Arps' Potato Guano .....	6.00	5.76	5.00
Arps' Scuppernong Guano for Trucks.....	6.00	4.12	7.00
Arps' H. G. Top Dresser.....	....	8.22	3.00
Genuine German Kainit .....	....	....	12.00

*Ashepoo Fertilizer Co., Charleston, S. C.—*

High Grade Ashepoo Dissolved Phosphate...	16.00	....	....
H. G. Bradley's Dissolved Phosphate.....	16.00	....	....
High Grade Ashepoo Acid Phosphate.....	14.00	....	....
H. G. Bradley's Acid Phosphate.....	14.00	....	....
Standard Bradley's Acid Phosphate.....	13.00	....	....
Standard Quininiplac Acid Phosphate.....	13.00	....	....
Standard Ashepoo Acid Phosphate .....	13.00	....	....
H. G. Ashepoo Bone and Potash.....	12.00	....	2.00
Standard Ashepoo Acid Phosphate and Potash	12.00	....	1.00
Standard Eutaw Acid Phosphate and Potash.	12.00	....	1.00
Standard Bradley's Acid Phosphate.....	12.00	....	....
Standard Ashepoo Acid Phosphate .....	12.00	....	....
Standard Eutaw Acid Phosphate .....	12.00	....	....
Standard Ashepoo Potash and Acid Phos- phate .....	11.00	....	1.00
Standard Eutaw Potash Acid Phosphate....	11.00	....	1.00
High Grade Ashepoo Watermelon Guano....	10.00	3.29	5.00
H. G. Ashepoo Cantaloupe Guano.....	10.00	2.46	10.00
H. G. Ashepoo Fruit Fertilizer.....	10.00	1.65	6.00
High Grade Bradley's Guano .....	10.00	1.65	4.00
H. G. Ashepoo Fertilizer .....	10.00	1.65	2.00
High Grade Ashepoo Superpotash Acid Phos- phate .....	10.00	....	4.00
H. G. Bradley's Potash Acid Phosphate....	10.00	....	4.00
H. G. Eutaw Superpotash Acid Phosphate...	10.00	....	4.00
Standard Bradley's Wheat Grower.....	10.00	....	2.00
Standard Enoree Acid Phosphate and Potash.	10.00	....	2.00
Standard Ashepoo Fertilizer .....	9.00	1.85	1.00
Standard Eutaw Fertilizer .....	9.00	1.85	1.00
Standard B. D. Sea Food Guano.....	9.00	1.85	1.00
Standard Bradley's Patent Superphosphate..	9.00	1.85	1.00
Standard Quininiplac Pine Island Ammoniated Superphosphate .....	9.00	1.85	1.00
Standard Cumberland Bone Superphosphate of Lime .....	9.00	1.85	1.00
Standard Americus Ammoniated Bone Super- phosphate .....	9.00	1.85	1.00
Standard Eutaw Guano .....	9.00	1.65	2.00
Standard Eutaw XX Guano .....	9.00	1.65	2.00
Standard Ashepoo Guano .....	9.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Standard Soluble Pacific Guano .....	9.00	1.65	2.00
Standard Ashpoo Guano .....	9.00	1.65	1.00
High Grade Bradley's Guano .....	8.00	3.29	4.00
High Grade Ashpoo Guano .....	8.00	3.29	4.00
High Grade Eutaw Special Cotton-seed Meal Guano .....	8.00	2.46	4.00
High Grade Eutaw Fertilizer .....	8.00	2.46	4.00
High Grade Bradley's Guano .....	8.00	2.46	3.00
High Grade Pacific Fertilizer .....	8.00	2.46	3.00
High Grade Ashpoo Cotton Fertilizer.....	8.00	2.46	3.00
High Grade Ashpoo Bird and Fish Guano..	8.00	2.46	3.00
High Grade Ashpoo Meal Mixture.....	8.00	2.46	3.00
High Grade Ashpoo Golden Tobacco Pro- ducer .....	8.00	2.46	3.00
High Grade Ashpoo Fertilizer .....	8.00	2.46	3.00
Standard Ashpoo Meal Guano .....	8.00	2.46	2.00
Standard Ashpoo Guano .....	8.00	2.06	2.00
Standard Eutaw Guano .....	8.00	2.06	2.00
Standard Ashpoo Fertilizer .....	8.00	1.65	2.00
Standard Bradley's Guano .....	8.00	1.65	2.00
Standard Brownwood Potash Acid Phosphate.	8.00	....	4.00
Sulphate of Ammonia .....	....	14.81	....
Muriate of Potash .....	....	....	45.00
Sulphate of Potash .....	....	....	45.00
German Kainit .....	....	....	12.00

*Atlanta Milling Co., Atlanta, Ga.—*

Cotton-seed Meal .....	....	7.50	....
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*The Atlantic Chemical Corporation, Norfolk, Va.—*

Pure Raw Bone Meal.....Total	21.50	3.71	....
Acco Thomas Phosphate .....	18.00	....	....
Atlantic High Grade 16 Per Cent Acid Phos- phate .....	16.00	....	....
Atlantic 14 Per Cent Acid Phosphate.....	14.00	....	....
Atlantic Dissolved Bone .....	13.00	....	....
Atlantic Corn Special .....	12.00	1.02	2.00
Atlantic Acid Phosphate .....	12.00	....	....
Atlantic 11 and 5 Bone and Potash Mixture..	11.00	....	5.00
Atlantic 10 and 5 Bone and Potash Mixture..	10.00	....	5.00
Atlantic 10 and 4 Bone and Potash Mixture..	10.00	....	4.00
Atlantic Bone and Potash for Grain.....	10.00	....	3.00
Atlantic Bone and Potash Mixture.....	10.00	....	2.00
Acco Tobacco Compound .....	9.00	2.47	3.00
Atlantic Meal Compound .....	9.00	2.27	2.00
Atlantic Cotton Grower .....	9.00	2.06	1.00
Corona Cotton Compound .....	9.00	1.65	3.00
Atlantic Special Guano .....	9.00	1.65	1.00
Atlantic Grain Guano .....	9.00	.82	3.00
Atlantic Fish Guano .....	9.00	.82	3.00
Atlantic Special 1-9-2 Guano.....	9.00	.82	2.00
Atlantic 4-8-5 Special Tobacco Grower.....	8.00	3.30	5.00
Atlantic Special Truck Guano .....	8.00	3.30	4.00
Oriental High Grade Guano.....	8.00	3.30	4.00
Paloma Tobacco Guano .....	8.00	3.30	4.00
Pitt County Light Tobacco Special.....	8.00	2.47	5.00
Boone's Special .....	8.00	2.47	4.00
Atlantic High Grade Tobacco Guano.....	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Atlantic High Grade Cotton Guano.....	8.00	2.47	3.00
Atlantic Tobacco Grower .....	8.00	2.06	3.00
Atlantic Tobacco Compound .....	8.00	2.06	2.00
Atlantic Special Wheat Fertilizer.....	8.00	1.65	2.00
Atlantic Soluble Guano .....	8.00	1.65	2.00
Atlantic Soluble Guano for Tobacco.....	8.00	1.65	2.00
Apex Peanut Grower .....	8.00	1.02	4.00
Atlantic 8 and 5 Bone and Potash Mixture..	8.00	....	5.00
Atlantic 8 and 4 Bone and Potash Mixture..	8.00	....	4.00
Atlantic 7 Per Cent Truck Guano.....	7.00	5.77	7.00
Atlantic Potato Guano .....	7.00	4.12	5.00
Perfection Peanut Grower .....	7.00	....	5.00
Atlantic Special Potato Guano .....	6.00	4.12	7.00
Atlantic 2-6-5 Special .....	6.00	1.65	5.00
Atlantic Side Dresser .....	4.00	8.22	4.00
Atlantic Special Top Dresser .....	4.00	6.18	2.50
Nitrate of Soda .....	....	15.22	....
Atlantic Top Dresser .....	....	7.42	3.00
Cotton-seed Meal .....	....	6.17	....
Sulphate of Potash .....	....	....	48.00
Muriate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00

*Atlantic Fertilizer Co., Atlanta, Ga.—*

Atlantic Acid and Potash Mixture H. G.....	12.00	....	6.00
Atlantic Acid and Potash Mixture H. G.....	10.00	....	5.00

*Baltimore Fertilizer Co., Baltimore, Md.—*

Honest Acid Phosphate .....	16.00	....	....
Honest Acid Phosphate .....	14.00	....	....
Honest Bone and Potash.....	10.00	....	2.00
Honest 4-8-5 .....	8.00	3.20	5.00
Honest Sweet Potato Grower.....	8.00	2.40	4.00
Honest Cotton Grower .....	8.00	2.40	3.00
Honest Ammoniated Bone .....	8.00	1.60	2.00
Honest Dixie Trucker .....	6.00	4.00	7.00
Honest Trucker .....	6.00	4.00	5.00

*Baugh & Sons Co., Phila., Pa., and Norfolk, Va.—*

Baugh's Raw Bone Meal, Warranted Pure,			
Total .....	21.50	3.70	....
Baugh's 16 Per Cent Acid Phosphate.....	16.00	....	....
Baugh's Pure Bone and Muriate of Potash			
Mixture .....	15.00	2.47	5.00
Baugh's High Grade Acid Phosphate.....	14.00	....	....
Baugh's Pure Dissolved Animal Bones.....	13.00	2.06	....
Baugh's 12 and 5 Phosphate and Potash....	12.00	....	5.00
Baugh's High Grade Cotton and Truck Guano	10.00	1.65	2.00
Baugh's 10 and 8 Phosphate and Potash....	10.00	....	8.00
Baugh's 10 and 4 Phosphate and Potash Mix-			
ture .....	10.00	....	4.00
Baugh's Soluble Alkaline Superphosphate....	10.00	....	2.00
Baugh's Grain and Grass Grower .....	9.00	.82	2.00
Baugh's H. G. Potato Grower.....	8.00	3.30	10.00
Baugh's Fish, Bone and Potash .....	8.00	3.30	4.00
Baugh's Yucatan Special Tobacco Guano....	8.00	3.30	4.00
Baugh's Fruit and Berry Guano .....	8.00	2.47	10.00

Name and Address of Manufacturer and Name of Brand.	Avall. Phos. Acid.	Nitrogen.	Potash.
Baugh's Special Tobacco Guano .....	8.00	2.47	5.00
Baugh's Grand Rapids High Grade Guano...	8.00	2.47	3.00
Baugh's Sweet Potato Guano for Sweet Po- tatoes .....	8.00	2.47	3.00
Baugh's High Grade Tobacco Guano.....	8.00	2.47	3.00
Baugh's Complete Animal Base Fertilizer...	8.00	1.65	5.00
Baugh's Fish Mixture .....	8.00	1.65	2.00
Baugh's Animal Base and Potash Compound for All Crops .....	8.00	1.65	2.00
Baugh's Wheat Fertilizer for Wheat and Grass .....	8.00	1.65	2.00
Baugh's Southern States Excelsior Guano...	8.00	1.00	3.00
Baugh's Southern States Guano for Bright Tobacco .....	7.00	2.88	7.00
Baugh's Potato and Truck Special.....	7.00	2.88	7.00
Baugh's Strawberry Mixture .....	7.00	2.47	5.00
Baugh's Fine Ground Fish .....Total	6.87	8.23	....
Baugh's 7 Per Cent Potato Guano.....	6.00	5.76	5.00
Baugh's P. P. P. Plentiful Potato.....	6.00	4.94	6.00
Baugh's Peruvian Guano Substitute for Pota- toes for All Vegetables .....	6.00	4.12	7.00
Baugh's Farmers' Friend Guano .....	6.00	4.12	7.00
Baugh's New Process 10 Per Cent Guano....	5.00	8.23	2.50
Baugh's Special Potato Manure.....	5.00	1.65	10.00
H. G. Tankage .....Total	4.00	6.58	....
Sulphate of Ammonia .....	....	20.57	....
Nitrate of Soda .....	....	15.63	....
Fine Ground Dried Blood .....	....	13.17	....
Baugh's Soluble Top Dresser for All Crops..	....	8.23	3.00
Muriate of Potash .....	....	....	50.00
High Grade Sulphate of Potash.....	....	....	48.00
Genuine German Kainit .....	....	....	12.40

*The Berkley Chemical Co., Norfolk, Va.—*

Pure Ground Bone .....Total	20.00	3.70	....
Resolute Acid Phosphate .....	16.00	....	....
Berkley Acid Phosphate .....	14.00	....	....
Berkley 12-5 Bone and Potash.....	12.00	....	5.00
Berkley Bone and Potash Mixture.....	11.00	....	2.00
Berkley Plant Food .....	10.00	....	4.00
Laurel Potash Mixture .....	10.00	....	2.00
Monitor Animal Bone Fertilizer .....	9.00	1.85	4.00
Select Crop Grower .....	8.50	2.06	2.50
Victory Special Crop Grower .....	8.00	3.29	4.00
Berkley H. G. Tobacco Grower.....	8.00	3.29	4.00
Berkley Tobacco Guano .....	8.00	2.47	3.00
Advance Crop Grower .....	8.00	2.47	3.00
Brandon Superphosphate .....	8.00	1.65	2.00
Long Leaf Tobacco Grower .....	8.00	1.65	2.00
Berkley Peanut and Grain Grower.....	8.00	1.00	4.00
Superior Bone and Potash.....	8.00	....	4.00
Mascot Truck Guano .....	7.00	4.11	5.00
Royal Truck Grower .....	6.00	5.76	5.00
The Leader of the World.....	5.00	3.29	5.00
Berkley Top Dresser .....	4.00	8.23	2.00
Nitrate of Soda .....	....	15.00	....
Dry Ground Fish .....	....	8.23	....
Special Top Dresser .....	....	7.41	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Muriate of Potash .....	....	....	49.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00

*Beta Fertilizer Co., Beta, N. C.—*

Beta Grass and Grain Fertilizer.....	10.00	....	2.00
Beta Potato and Truck .....	8.00	4.00	7.00
Beta Fertilizer .....	8.00	4.00	4.00
Beta Special Corn Grower .....	8.00	3.00	5.00
Beta Special Cotton .....	8.00	3.00	3.00
Beta Regulator Corn Grower .....	8.00	2.00	2.00
Beta Special Lawn .....	4.00	2.00	2.00

*S. T. Beveridge & Co., Richmond, Va.—*

Beveridge's Raw Ground Bone Meal....Total	20.00	3.70	....
Beveridge's Thomas or Basic Slag.....Total	20.00	....	....
Beveridge's Thomas or Basic Slag.....Total	17.00	....	....

*Blackstone Guano Co., Inc., Blackstone, Va.—*

Clover Leaf 16 Per Cent Phosphate.....	16.00	....	....
Bone and Phosphate Half and Half.....	15.00	1.65	....
Bla. G. Co., Inc., Acid Phosphate.....	14.00	....	....
Clover Leaf for Grain .....	13.00	1.03	1.00
Dissolved Bone .....	10.00	1.03	1.00
B. G. Co., Inc., Bone and Potash.....	10.00	....	4.00
B. G. Co., Inc., Bone and Potash.....	10.00	....	2.00
Blackstone Special for Tobacco .....	9.00	2.47	3.00
Old Bellefonte .....	8.00	3.30	2.00
Clover Leaf for Tobacco .....	8.00	2.47	3.00
Tobacco Special .....	8.00	2.47	3.00
Wrapper Brand .....	8.00	2.47	3.00
Jim Crow for Tobacco .....	8.00	2.47	3.00
Bellefonte .....	8.00	2.47	2.00
Hard Cash for Tobacco .....	8.00	2.06	2.00
Carolina Special for Tobacco .....	8.00	1.65	4.00
Standard Guano .....	8.00	1.65	2.00
Red Letter for Tobacco .....	8.00	1.65	2.00
Alliance for Tobacco .....	8.00	1.65	2.00
Leader for Tobacco .....	8.00	1.65	2.00
Peanut Special .....	8.00	1.03	6.00
Material for Special Order .....	....	4.95	....

*Bowker Fertilizer Co., Baltimore, Md., and Boston, Mass.—*

16 Per Cent Dissolved Bone Phosphate.....	16.00	....	....
Bowker's Soluble Phosphate .....	14.00	....	....
Golden Harvest Fertilizer .....	12.00	....	5.00
Imperial Alkaline Phosphate .....	10.00	....	4.00
Superphosphate with Potash for Grass and Grain .....	10.00	....	2.00
Animal Bone Fertilizer .....	9.00	1.85	4.00
Blood, Bone and Fish.....	8.00	3.29	4.00
Sure Crop Cotton-seed Meal Compound.....	8.00	3.29	4.00
Bowker's Red Oak Tobacco Fertilizer.....	8.00	2.47	7.00
Bowker's White Star Compound.....	8.00	2.47	4.00
Tobacco Fertilizer .....	8.00	2.47	3.00
Eureka Cotton Compound .....	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Excelsior C. S. M. Mixture.....	8.00	1.65	2.00
Empire Standard .....	8.00	1.65	2.00
Corn and Grain Grower .....	8.00	.82	4.00
Southern Special Compound .....	7.00	3.29	5.00
Bowker's 7 Per Cent Potato Guano.....	6.00	5.76	5.00
H. G. Top Dresser .....	....	7.41	3.00

*Boykin Chemical and Fertilizer Co., Baltimore, Md.—*

Boykin Top Dresser .....	....	7.41	3.00
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*H. P. Brown Guano Co., Salisbury, N. C.—*

Brown's Ground Rock Phosphate.....Total	28.00	....	....
Brown's 21½-4½ Bone Meal .....	21.05	3.70	....
Brown's 20-12 Bone and Potash.....	20.00	....	12.00
Brown's 20-8 Bone and Potash.....	20.00	....	8.00
Brown's Thomas Phosphate .....17.00 to	19.00	....	....
Brown's 16 Per Cent Acid Phosphate.....	16.00	....	....
Brown's 14 Per Cent Acid Phosphate.....	14.00	....	....
Brown's Dissolved Animal Bone .....	13.00	2.06	....
Brown's 13 Per Cent Acid Phosphate.....	13.00	....	....
Brown's 12-6 Bone and Potash.....	12.00	....	6.00
Brown's 12-5 Bone and Potash.....	12.00	....	5.00
Brown's 12-4 Bone and Potash.....	12.00	....	4.00
Brown's 12-3 Bone and Potash.....	12.00	....	3.00
Brown's 12 Per Cent Acid Phosphate.....	12.00	....	....
Brown's 11-5 Bone and Potash.....	11.00	....	5.00
Brown's 10-4-4 Guano .....	10.00	3.29	4.00
Brown's 10-3-3 Guano .....	10.00	2.47	3.00
Brown's 10-2-2 Guano .....	10.00	1.65	2.00
Brown's 10-1¼-6 Guano .....	10.00	1.03	6.00
Brown's 10-6 Bone and Potash.....	10.00	....	6.00
Brown's 10-5 Bone and Potash.....	10.00	....	5.00
Brown's 10-4 Bone and Potash.....	10.00	....	4.00
Brown's 10-3 Bone and Potash.....	10.00	....	3.00
Brown's 10-2 Bone and Potash.....	10.00	....	2.00
Brown's 9-3-3 Guano .....	9.00	2.47	3.00
Brown's 9-2¾-2 Guano .....	9.00	2.26	2.00
Brown's 9-2¼-4 Guano .....	9.00	1.85	4.00
Brown's 9-2-3 Guano .....	9.00	1.65	3.00
Brown's 9-1-3 Guano .....	9.00	.82	3.00
Brown's 8-4½-7 Guano .....	8.00	3.71	7.00
Brown's 8-4½-7 Tobacco Guano .....	8.00	3.71	7.00
Brown's 8-4-6 Guano .....	8.00	3.29	6.00
Brown's 8-4-6 Tobacco Guano .....	8.00	3.29	6.00
Brown's 8-4-4 Guano .....	8.00	3.29	4.00
Brown's 8-3-5 Guano .....	8.00	2.47	5.00
Brown's 8-3-5 Tobacco Guano .....	8.00	2.47	5.00
Brown's 8-3-3 Guano .....	8.00	2.47	3.00
Brown's 8-3-3 Tobacco Guano .....	8.00	2.47	3.00
Brown's 8-2½-3 Guano .....	8.00	2.06	3.00
Brown's 8-2½-3 Tobacco Guano .....	8.00	2.06	3.00
Brown's 8-2½-2 Guano .....	8.00	2.06	2.00
Brown's 8-2½-2 Tobacco Guano .....	8.00	2.06	2.00
Brown's 8-2-10 Guano .....	8.00	1.65	10.00
Brown's 8-2-3 Guano .....	8.00	1.65	3.00
Brown's 8-2-2 Guano .....	8.00	1.65	2.00
Brown's 8-2-2 Tobacco Guano .....	8.00	1.65	2.00
Brown's 8-1-4 Guano .....	8.00	.82	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Brown's 8-1-3 Guano .....	8.00	.82	3.00
Brown's 8-5 Bone and Potash.....	8.00	....	5.00
Brown's 8-4 Bone and Potash.....	8.00	....	4.00
Brown's 7-7-7 Guano .....	7.00	5.76	7.00
Brown's 7-5-8 Guano .....	7.00	4.12	8.00
Brown's 7-5-5 Guano .....	7.00	4.12	5.00
Brown's 7-4-5 Guano .....	7.00	3.29	5.00
Brown's 4-7½-2 Top Dresser .....	4.00	8.17	2.00
Brown's Fish Scrap .....	....	8.24	....
Brown's Nitrate of Soda .....	....	15.00	....
Brown's Dried Blood .....	....	13.00	....
Brown's 12 Per Cent Kainit.....	....	12.00	....
Brown's Top Dresser .....	....	7.40	3.00
Brown's Cotton-seed Meal .....	....	6.17	....
Brown's 7 Per Cent Tankage .....	....	5.76	....
Brown's Muriate of Potash .....	....	....	48.00
Brown's Sulphate of Potash .....	....	....	48.00

*C. J. Burton Guano Co., Baltimore, Md.—*

Burton's 16 Per Cent Acid Phosphate.....	16.00	....	....
Burton's 14 Per Cent Acid Phosphate.....	14.00	....	....
Burton's Alkaline .....	10.00	....	4.00
Burton's Potash Mixture .....	10.00	....	2.00
Burton's High Grade Tobacco.....	8.00	3.29	4.00
Burton's Best .....	8.00	2.47	3.00
Tobacco Queen .....	8.00	2.47	3.00
Burton High Grade .....	8.00	2.06	3.00
Burton's Butcher Bone .....	8.00	1.65	2.00

*Caraleigh Phosphate and Fertilizer Works,*

*Raleigh, N. C.—*

Raw Bone Meal .....	Total	45.00	3.70	....
16 Per Cent Acid Phosphate.....		16.00	....	....
Climax Dissolved Bone .....		14.00	....	....
Sterling Acid Phosphate .....		13.00	....	....
Staple Acid Phosphate .....		12.00	....	....
Horne & Son's High Grade Bone and Potash.		11.00	....	5.00
Special Bone and Potash Mixture.....		10.00	....	4.00
Morris & Scarboro's Special Bone and Potash.		10.00	....	3.00
Electric Bone and Potash Mixture.....		10.00	....	2.00
Pacific Tobacco and Cotton Grower.....		9.00	2.26	2.00
Rhankatte Special Tobacco Guano.....		8.00	3.29	6.00
Special 8-4-4 .....		8.00	3.39	4.00
Caraleigh Meal and Tankage Mixture.....		8.00	3.29	4.00
Horne's Best .....		8.00	2.47	3.00
Eclipse Ammoniated Guano .....		8.00	2.47	3.00
Caraleigh Formula for Tobacco.....		8.00	2.47	3.00
Planter's Pride .....		8.00	2.06	3.00
Caraleigh Special Tobacco Guano.....		8.00	2.06	3.00
Eli Ammoniated Fertilizer .....		8.00	1.65	2.00
Crown Ammoniated Guano .....		8.00	1.65	2.00
Comet Guano .....		8.00	.82	3.00
Buncombe Corn Grower .....		8.00	....	4.00
Buncombe Wheat Grower .....		8.00	....	4.00
Caraleigh Top Dresser .....		3.00	8.23	4.00
Nitrate of Soda .....		....	15.63	....
Dried Blood .....		....	13.16	....
Kanona Tankage .....		....	9.04	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Ground Fish .....	....	8.82	....
Sulphate of Potash .....	....	....	50.00
Muriate of Potash .....	....	....	50.00
Genuine German Kainit .....	....	....	12.00

*Carolina Union Fertilizer Co., Norfolk, Va.—*

Carolina Union Raw Bone Meal.....Total	21.00	3.71	....
Carolina Union 16 Per Cent.....	16.00	....	....
Carolina Union 14 Per Cent.....	14.00	....	....
Carolina Union 12-5.....	12.00	....	5.00
Carolina Union 10-5.....	10.00	....	5.00
Carolina Union 10-4.....	10.00	....	4.00
Carolina Union 10-2.....	10.00	....	2.00
Carolina Union 2¼-9-4 Guano.....	9.00	1.85	4.00
Carolina Union 1-9-2.....	9.00	.82	2.00
Carolina Union 4-8-4.....	8.00	3.30	4.00
Carolina Union 3-8-3.....	8.00	2.47	3.00
Carolina Union 2½-8-3.....	8.00	2.06	3.00
Carolina 2-8-2 .....	8.00	1.65	2.00
Carolina Union 1-8-4.....	8.00	.82	4.00
Carolina Union 10-2-2.....	2.00	8.25	2.00
Nitrate of Soda .....	....	14.85	....
Muriate of Potash .....	....	....	50.00
Genuine German Kainit .....	....	....	12.00

*Catawba Fertilizer Co., Lancaster, S. C.—*

Catawba High Grade Acid Phosphate.....	16.00	....	....
Catawba High Grade Acid Phosphate.....	14.00	....	....
Catawba Acid and Potash .....	12.00	....	5.00
Catawba Acid and Potash .....	12.00	....	4.00
Catawba Special .....	10.00	3.29	4.00
Catawba Farmers' King .....	10.00	1.65	5.00
Catawba Climax .....	10.00	1.65	2.00
Catawba Preference .....	10.00	1.65	2.00
Catawba Grain King .....	10.00	.82	4.00
Catawba Acid and Potash .....	10.00	....	4.00
Catawba Acid and Potash .....	10.00	....	2.00
Catawba Gold Medal .....	9.00	2.47	7.00
Catawba Farmers' Special .....	9.00	2.47	2.00
Catawba Old Hickory .....	8.00	3.29	6.00
Catawba Regulator .....	8.00	3.29	4.00
Catawba Reliable .....	8.00	3.29	4.00
Catawba Electric .....	8.00	3.29	4.00
Catawba Farmers' Choice .....	8.00	2.47	5.00
Catawba Red Rose .....	8.00	2.47	3.00
Catawba Peerless .....	8.00	2.47	3.00
Catawba Red Star .....	8.00	2.47	3.00
Catawba Champion .....	8.00	2.05	3.00
Catawba Standard Formula .....	8.00	2.05	3.00
Catawba Standard .....	8.00	2.05	2.00
Catawba Eclipse .....	8.00	1.65	2.00
Catawba Economizer .....	8.00	1.65	2.00
Catawba Dixie .....	8.00	1.65	2.00
Catawba Acid and Potash .....	8.00	....	4.00
Catawba Cotton Producer .....	6.00	4.93	5.00
Catawba H. G. Top Dresser.....	4.00	6.16	2.50
Catawba Superior .....	4.00	5.75	7.00
Catawba Excelsior .....	4.00	5.75	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Catawba Nitrate of Soda .....	....	15.00	....
Catawba Muriate of Potash .....	....	....	48.00
Catawba Kainit .....	....	....	12.00
<i>Central Phosphate Co., Mount Pleasant, Tenn.—</i>			
Tennessee Phosphate .....Total	32.00	....	....
Tennessee Phosphate .....Total	28.00	....	....
<i>Chatham Oil and Fertilizer Co., Pittsboro, N. C.—</i>			
C. O. & F. Co. Acid Phosphate.....	16.00	....	....
C. O. & F. Co. Acid Phosphate.....	14.00	....	....
C. O. & F. Co. Bone and Potash.....	10.00	....	5.00
C. O. & F. Co. Bone and Potash.....	10.00	....	2.00
Chatham Corn Grower .....	9.00	1.23	3.00
Pittsboro High Grade .....	8.00	3.30	4.00
High Land Tobacco Grower.....	8.00	2.47	3.00
Pride of Chatham .....	8.00	2.47	3.00
London's Special .....	8.00	2.47	3.00
Chatham Cotton Grower .....	8.00	1.65	2.00
C. O. & F. Co. German Kainit.....	....	....	12.00
<i>The Chesapeake Chemical Co., Baltimore, Md.—</i>			
C. C. Co.'s Dissolved Phosphate 16 Per Cent.	16.00	....	....
C. C. Co.'s Dissolved Phosphate 14 Per Cent.	14.00	....	....
C. C. Co.'s Reliable Phosphate .....	10.00	....	4.00
C. C. Co.'s Celebrated Mixture .....	10.00	....	2.00
C. C. Co.'s High Grade Guano .....	8.00	3.28	4.00
C. C. Co.'s Excelsior Fertilizer .....	8.00	2.46	4.00
C. C. Co.'s Fish Guano .....	8.00	2.46	3.00
C. C. Co.'s Ammoniated Phosphate .....	8.00	1.64	3.00
C. C. Co.'s National Crop Grower .....	8.00	1.64	2.00
C. C. Co.'s Keystone Phosphate .....	7.00	3.28	5.00
C. C. Co.'s Potato Compound .....	6.00	4.10	5.00
C. C. Co.'s Prolific Top Dresser .....	....	7.51	3.50
C. C. Co.'s German Kainit .....	....	....	12.40
<i>City Abattoir of Winston-Salem, Winston-Salem, N. C.—</i>			
Tankage .....	8.50	5.74	....
<i>Clayton Oil Mill, Clayton, N. C.—</i>			
C. O. M. 16 Per Cent Acid Phosphate.....	16.00	....	....
C. O. M. High Grade Bone and Potash.....	12.00	....	5.00
C. O. M. Wheat Compound .....	10.00	2.05	4.50
C. O. M. Bone and Potash .....	10.00	....	5.00
R. B. W. Special .....	9.00	3.30	4.00
Austin's Special .....	9.00	2.47	3.00
Wayside Special .....	9.00	1.65	4.00
C. W. H. Special .....	8.00	5.00	5.00
C. O. M. Cotton Grower.....	8.00	3.30	4.00
Clayton Guano .....	8.00	2.47	3.00
Planters' Favorite .....	8.00	2.47	3.00
Clayton Sec. Tobacco Grower.....	8.00	2.47	3.00
Cotton Queen .....	8.00	1.65	2.00
Summer Queen .....	8.00	1.65	2.00
C. O. M. Top Dresser.....	3.00	7.75	2.00
C. O. M. German Kainit.....	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
<i>The Coe-Mortimer Co., Charleston, S. C.—</i>			
Gen. Key—Tree Brand Thomas Phosphate, Total .....	18.00	....	....
Gen. Key—Tree Brand Thomas Phosphate, Total .....	17.50	....	....
Coe-Mortimer Co.'s Dissolved Bone .....	16.00	....	....
Coe-Mortimer Co.'s Dissolved Bone .....	14.00	....	....
Coe-Mortimer Co.'s Level Best .....	10.00	3.29	4.00
Coe-Mortimer Co.'s Progressive Farmer .....	10.00	2.47	3.00
Coe-Mortimer Co.'s Bone and Potash.....	10.00	....	4.00
Coe-Mortimer Co.'s Bone and Potash.....	10.00	....	2.00
Coe-Mortimer Co.'s Corn Club .....	9.25	2.05	2.00
Carolina Special .....	9.00	2.47	3.00
Coe-Mortimer Co.'s Excelsior .....	9.00	2.05	4.00
Coe-Mortimer Co.'s M. H. G.....	9.00	1.65	3.00
Knickerbocker Standard .....	9.00	1.65	2.00
Coe-Mortimer Co.'s Tar Heel.....	9.00	.82	3.00
Coe-Mortimer Co.'s Special Formula.....	8.50	1.65	2.00
High Grade Tankage .....	8.00	7.81	9.50
E. Frank Co.'s Extra High Grade.....	8.00	4.11	7.00
Marcoe Guano .....	8.00	3.29	4.00
C. M. C.'s Tobacco Grower.....	8.00	3.28	4.00
Coe-Mortimer Co.'s Tobacco Fertilizer, No. 3.	8.00	2.47	6.00
Coe-Mortimer Co.'s Tobacco Fertilizer, No. 2.	8.00	2.47	5.00
Coe-Mortimer Co.'s Tobacco Fertilizer, No. 1.	8.00	2.47	4.00
Coe-Mortimer Co.'s Meal Mixture .....	8.00	2.47	4.00
C. M. C.'s Tobacco Special.....	8.00	2.47	3.00
Darlington Guano .....	8.00	2.47	3.00
Coe-Mortimer Co.'s Cotton and Corn.....	8.00	2.05	3.00
Coe-Mortimer Co.'s General Crop .....	8.00	2.05	2.00
Coe-Mortimer Co.'s Standard .....	8.00	2.05	1.00
Coe-Mortimer Co.'s Straight Goods .....	8.00	1.65	3.00
Universal .....	8.00	1.65	2.00
Coe-Mortimer Co.'s Bone and Potash.....	8.00	....	4.00
Mortimer's High Grade .....	7.00	4.11	5.00
Imported Fish Guano .....	5.80	8.22	10.00
Coe-Mortimer Co.'s Top Dresser.....	4.00	6.17	2.50
H. G. Blood .....	....	13.37	16.25
Nitrate of Soda .....	....	14.83	....
Muriate of Potash .....	....	....	49.00
Sulphate of Potash .....	....	....	49.00
Muriate Mixture .....	....	....	20.00
Genuine German Kainit .....	....	....	12.00

*Columbia Guano Co., Norfolk, Va.—*

Pure Raw Bone Meal.....Total	21.50	3.71	....
Columbia Thomas Phosphate .....	18.00	....	....
Columbia High Grade 16 Per Cent Acid Phos- phate .....	16.00	....	....
Columbia 14 Per Cent Acid Phosphate.....	14.00	....	....
Columbia Dissolved Bone .....	13.00	....	....
Columbia 12 and 6 Bone and Potash Mixture.	12.00	....	6.00
Columbia 12 and 5 Bone and Potash.....	12.00	....	5.00
Columbia 12 and 5 B. and P. Mixture.....	12.00	....	5.00
Columbia Acid Phosphate .....	12.00	....	....
Columbia 11 and 5 Bone and Potash Mixture.	11.00	....	5.00
Columbia 10½ and 1½ Bone and Potash Mix- ture .....	10.50	....	1.50

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Columbia 10 and 5 Bone and Potash Mixture.	10.00	....	5.00
Columbia 10 and 4 Bone and Potash Mixture.	10.00	....	4.00
Columbia Bone and Potash for Grain.....	10.00	....	3.00
Columbia Bone and Potash Mixture.....	10.00	....	2.00
Columbia C. S. M. Special.....	9.00	2.27	2.00
Parrish's Special .....	9.00	2.06	5.00
Roanoke Ammoniated Guano .....	9.00	1.65	3.00
Carolina Soluble Guano .....	9.00	1.65	1.00
Columbia Grain Guano .....	9.00	.82	3.00
Columbia Special 1-9-2 Guano.....	9.00	.82	2.00
Columbia Special Truck .....	8.00	4.12	5.00
Tobacco King .....	8.00	3.30	5.00
Pelican Ammoniated Guano .....	8.00	3.30	4.00
Columbia Special Truck Guano.....	8.00	3.30	4.00
Trojan Tobacco Guano .....	8.00	3.30	4.00
Columbia Special 4-8-3 .....	8.00	3.30	3.00
Yelverton Bros.' Plant Food for Tobacco.....	8.00	2.47	5.00
Columbia 8-3-4 Special Guano.....	8.00	2.47	4.00
Olympia Cotton Guano .....	8.00	2.47	3.00
Hyco Tobacco Guano .....	8.00	2.47	3.00
Our Best Meal Guano.....	8.00	2.47	3.00
Royal Tobacco Fertilizer .....	8.00	2.06	3.00
Columbia Special Tobacco Guano.....	8.00	2.06	2.00
Columbia 8-2-5 Tobacco Special.....	8.00	1.65	5.00
Columbia Fish and Blood Guano.....	8.00	1.65	4.00
Columbia Fish Phosphate and Potash.....	8.00	1.65	4.00
Columbia Fish Phosphate and Potash.....	8.00	1.65	3.00
Columbia Soluble Guano for Tobacco.....	8.00	1.65	2.00
Columbia Special Wheat Fertilizer .....	8.00	1.65	2.00
Columbia Soluble Guano .....	8.00	1.65	2.00
Spinola Peanut Grower .....	8.00	1.02	4.00
Columbia 8 and 4 Bone and Potash Mixture.	8.00	....	4.00
Columbia Special 7 Per Cent Truck Guano...	7.00	5.77	7.00
Columbia Potato Manure .....	7.00	4.12	7.00
Columbia Potato Guano .....	7.00	4.12	5.00
Crown Brand Peanut Guano.....	7.00	....	5.00
Columbia Irish Potato Grower .....	6.00	4.12	7.00
Perfection Potato Producer .....	5.00	4.94	7.00
Columbia Side Dresser .....	4.00	8.22	4.00
Columbia Special Top Dresser .....	4.00	6.18	2.50
Columbia Top Dresser .....	....	7.42	3.00
Nitrate of Soda .....	....	15.22	....
Cotton-seed Meal .....	....	6.17	....
Sulphate of Potash .....	....	....	48.00
Muriate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00

*Combahee Fertilizer Co., Charleston, S. C.—*

C. F. Co. Dissolved Bone.....	16.00	....	....
C. F. Co. Dissolved Bone.....	14.00	....	....
C. F. Pure Dissolved Bone.....	13.00	....	....
C. F. Co. Melon Fertilizer.....	10.00	3.30	5.00
C. F. Co. Cantaloupe Fertilizer.....	10.00	2.47	10.00
Acid with Potash .....	10.00	....	2.00
Special Mixture .....	9.00	1.65	2.00
C. F. Co. K. M. S.....	8.00	3.30	4.00
C. F. Co. H. G. Cotton Mixture.....	8.00	2.47	3.00
C. F. Co. Cotton and Corn Compound.....	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Nitrate of Soda .....	....	14.83	....
Muriate of Potash .....	....	....	48.00
Kainit .....	....	....	12.00

*Conestee Chemical Co., Wilmington, N. C.—*

16 Per Cent Acid Phosphate.....	16.00	....	....
Conestee High Grade Acid Phosphate.....	14.00	....	....
Conestee Bone and Potash.....	12.00	....	6.00
Conestee Bone and Potash.....	12.00	....	5.00
Conestee Bone and Potash.....	12.00	....	4.00
Conestee Bone and Potash.....	12.00	....	3.00
Conestee Bone and Potash.....	12.00	....	2.00
Conestee Bone and Potash.....	11.00	....	6.00
Conestee Bone and Potash.....	11.00	....	5.00
Conestee Bone and Potash.....	11.00	....	4.00
Conestee Bone and Potash.....	11.00	....	3.00
Conestee Bone and Potash.....	11.00	....	2.00
Conestee Bone and Potash.....	10.00	....	6.00
Conestee Bone and Potash.....	10.00	....	5.00
Conestee Bone and Potash.....	10.00	....	4.00
Conestee Bone and Potash.....	10.00	....	3.00
Conestee Bone and Potash.....	10.00	....	2.00
Conestee Square Deal Fertilizer for Tobacco.	9.25	1.65	2.00
Conestee Square Deal Fertilizer .....	9.25	1.65	2.00
Adams' Special Fertilizer .....	9.00	2.47	3.00
Conestee Cotton Grower .....	9.00	2.27	2.00
Conestee Premo Guano .....	9.00	.82	3.00
Conestee Special Fertilizer for Cotton.....	8.00	4.12	7.00
Conestee Melon Grower .....	8.00	4.12	7.00
Conestee Special Fertilizer for Tobacco.....	8.00	4.12	7.00
Conestee O. K. Fertilizer for Tobacco.....	8.00	3.30	4.00
Conestee P. D. Q. Fertilizer.....	8.00	3.30	4.00
Conestee "O. K." Fertilizer .....	8.00	3.30	4.00
Conestee P. D. Q. Fertilizer for Tobacco.....	8.00	3.30	4.00
Conestee Plumb Good Fertilizer .....	8.00	2.47	4.00
Conestee Crop Grower for Tobacco.....	8.00	2.47	4.00
Conestee Fish Scrap Guano for Tobacco.....	8.00	2.47	3.00
Conestee 8-3-3 C. S. M. Guano.....	8.00	2.47	3.00
Conestee 8-3-3 C. S. M. Guano for Tobacco...	8.00	2.47	3.00
Conestee Fish Scrap Guano .....	8.00	2.47	3.00
Conestee Special Fertilizer .....	8.00	2.47	3.00
Conestee Special Tobacco Fertilizer.....	8.00	2.47	3.00
Conestee Fertilizer for Tobacco .....	8.00	2.47	2.50
Conestee Fertilizer .....	8.00	2.47	2.50
Conestee Crop Grower .....	8.00	2.06	3.00
Conestee Tobacco Grower .....	8.00	2.06	3.00
Conestee Complete Fertilizer .....	8.00	2.06	2.00
Conestee Special Grain Fertilizer .....	8.00	1.65	2.00
Conestee Standard Guano for Tobacco.....	8.00	1.65	2.00
Conestee Standard Guano .....	8.00	1.65	2.00
Cotton-seed Meal Guano for Tobacco.....	8.00	1.65	2.00
Cotton-seed Meal Guano .....	8.00	1.65	2.00
Conestee Bone and Potash .....	8.00	....	6.00
Conestee Bone and Potash .....	8.00	....	5.00
Conestee Bone and Potash .....	8.00	....	4.00
Conestee Root Crop Guano .....	7.00	4.12	7.00
Conestee Standard Truck Guano .....	7.00	4.12	5.00
Conestee High Grade Guano .....	6.00	4.94	8.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Conestee Truck Grower .....	6.00	3.30	8.00
Conestee Corn Guano .....	6.00	2.47	3.00
Dried Ground Fish .....	4.50	7.81	....
Conestee Special Top Dresser .....	4.00	8.25	4.00
Sulphate of Ammonia .....	....	20.56	....
Nitrate of Soda .....	....	14.81	....
Dried Ground Blood .....	....	11.51	....
Conestee Top Dresser .....	....	7.40	3.00
Cotton-seed Meal .....	....	6.17	....
Muriate of Potash .....	....	....	48.00
Sulphate of Potash .....	....	....	48.00
H. G. German Kainit 16 Per Cent.....	....	....	16.00
Genuine German Kainit .....	....	....	12.00

*Contentnea Guano Co., Wilson, N. C.—*

High Grade 16 Per Cent Acid.....	16.00	....	....
Contentnea 14 Per Cent Acid.....	14.00	....	....
"Corn Club" Special .....	10.00	.82	5.00
Bone and Potash Mixture, No. 3.....	10.00	....	5.00
Bone and Potash Mixture, No. 2.....	10.00	....	4.00
Bone and Potash Mixture, No. 1.....	10.00	....	2.00
Contentnea Cotton Formula .....	9.00	2.25	2.00
Bartholomew's Cotton Grower .....	9.00	1.85	5.00
S-4½-7 for Tobacco .....	8.00	3.70	7.00
S-4½-7 for Cotton .....	8.00	3.70	7.00
Climax High Grade .....	8.00	3.30	4.00
Climax H. G. for Cotton .....	8.00	3.30	4.00
Carr Tobacco Grower .....	8.00	2.90	6.00
High Grade Tobacco Grower.....	8.00	2.90	5.00
Government Formula, No. 1.....	8.00	2.47	10.00
Government Formula, No. 2.....	8.00	2.47	7.00
Victor Tobacco Grower .....	8.00	2.47	5.00
Farmers' Favorite Tobacco Grower.....	8.00	2.47	4.00
Plant-bed Tobacco Grower .....	8.00	2.47	3.00
Pick Leaf Tobacco Fertilizer.....	8.00	2.47	3.00
Top Notch Fertilizer .....	8.00	2.47	3.00
Matchless Cotton Grower .....	8.00	2.47	3.00
Contentnea Cotton Grower .....	8.00	2.47	2.50
Bragg Cotton Grower .....	8.00	2.05	3.00
Blood and Bone Cotton Grower.....	8.00	1.65	2.00
Bragg Corn Grower .....	8.00	.82	5.00
Contentnea Corn Special .....	5.00	1.65	5.00
High Grade Top Dresser.....	4.00	8.25	4.00
Contentnea Top Dresser .....	3.00	8.25	5.00
Nitrate of Soda .....	....	14.82	....
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	50.00
Manurè Salts .....	....	....	20.00
H. G. 16 Per Cent German Kainit.....	....	....	16.00
German Kainit .....	....	....	12.00

*Cooper Guano Co., Wilmington, N. C.—*

Cooper's 4½ Per Cent Raw Bone Meal.....	22.50	3.71	....
Cooper's Acid with Potash .....	10.00	....	5.00
Cooper's Zenith .....	8.00	2.00	3.00
Cooper's High Grade .....	7.00	6.00	5.00

*Coöperative Warehouse Co., Salisbury, N. C.—*

Farmers' Union Cotton-seed Meal.....	....	6.17	....
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Name and Address of Manufacturer and Name of Brand.	Avall. Phos. Acid.	Nitrogen.	Potash.
<i>Coweta Fertilizer Co., Norfolk, Va.—</i>			
Coweta 16 Per Cent Acid Phosphate.....	16.00	....	....
Coweta High Grade Acid Phosphate.....	14.00	....	....
Coweta Acid Phosphate .....	13.00	....	....
Coweta Fish Guano .....	10.00	1.65	2.00
Coweta Standard Bone and Potash.....	10.00	....	4.00
Coweta Dissolved Bone and Potash.....	10.00	....	2.00
Coweta Nonpareil Grower .....	9.00	.83	3.00
Coweta Animal Bone .....	8.00	3.29	4.00
Sea Bird Standard Guano.....	8.00	2.47	3.00
Coweta Perfection Tobacco Grower .....	8.00	2.47	3.00
Coweta Royal Guano .....	8.00	2.06	3.00
Coweta Beef Blood and Bone.....	8.00	2.06	1.00
Coweta Success Guano .....	8.00	1.65	2.00
Coweta Special Bone and Potash.....	8.00	....	4.00
Coweta Standard Truck Guano.....	6.00	4.12	7.00
Nitrate of Soda .....	....	14.83	....
Cotton-seed Meal .....	....	6.17	....
Muriate of Potash .....	....	....	49.00
Genuine German Kainit .....	....	....	12.00
<i>Craven Chemical Co., New Bern, N. C.—</i>			
Panama 16 Per Cent Phosphate.....	16.00	....	....
Jewel Acid Phosphate .....	14.00	....	....
Turkey Trot Bone and Potash.....	12.00	....	6.00
Herring's Bone and Potash.....	12.00	....	5.00
Craven H. G. Bone and Potash.....	12.00	....	4.00
Foy's H. G. Bone and Potash Mixture.....	10.00	....	6.00
Craven Grain Compound .....	10.00	....	4.00
Trent Bone and Potash.....	10.00	....	2.00
Halifax Guano .....	9.00	2.47	3.00
Prolix 9-2-3 Special Guano.....	9.00	1.65	3.00
Hanover Standard Guano .....	8.00	3.29	4.00
Currituck Sweet Potato Guano.....	8.00	2.47	6.00
Duplin Tobacco Guano .....	8.00	2.47	3.00
Gaston High Grade Fertilizer.....	8.00	2.47	3.00
C. E. Foy High Grade Guano.....	8.00	2.47	3.00
C. C. Co. Standard Tobacco Guano.....	8.00	2.47	3.00
Hart's Special Tobacco Grower.....	8.00	2.47	3.00
Marvel Great Crop Grower.....	8.00	2.06	3.00
Elite Cotton Guano .....	8.00	1.65	2.00
Pantego Potato Guano .....	7.00	4.12	7.00
Neuse Truck Grower .....	6.00	4.94	6.00
Craven Chemical Co.'s Truck Guano, 5-10-2½.	5.00	8.24	2.50
Craven Chemical Co.'s Top Dresser A.....	4.00	8.24	4.00
Craven Chemical Co.'s Top Dresser B.....	4.00	6.18	2.50
Craven Chemical Co.'s Top Dresser C.....	....	7.41	3.00
Genuine German Kainit .....	....	....	12.00
<i>Dey &amp; Brother, Beaufort, N. C.—</i>			
Ground Fish Scrap .....	7.00	8.23	....
<i>Dixie Guano Co., Durham, N. C.—</i>			
Dixie 16 Per Cent Acid Phosphate.....	16.00	....	....
Dixie 14 Per Cent Acid Phosphate.....	14.00	....	....
Dixie Champion for Wheat and Corn.....	10.50	....	1.50
Jeff Davis Special .....	9.00	2.26	2.00

Name and Address of Manufacturer and Name of Brand.	Avall. Phos. Acid.	Nitrogen.	Potash.
Dixie Star Ammoniated .....	9.00	1.65	2.00
Dixie Corn Fertilizer .....	9.00	.82	3.00
Radium Brand Guano .....	8.00	3.28	5.00
Dixie Tobacco Fertilizer .....	8.00	2.46	3.00
Carolina Special Ammoniated .....	8.00	2.46	3.00
Sulky Plow Brand Guano.....	8.00	2.46	2.00
Battle's Blood and Bone Fertilizer.....	8.00	2.05	3.00
Niagara Soluble Bone .....	8.00	2.05	2.00
Dixie Cotton Fertilizer .....	8.00	1.65	2.00
Old Plantation Superphosphate .....	8.00	1.65	2.00
Nitrate of Soda .....	....	14.82	....
Sulphate of Potash .....	....	....	49.00
Muriate of Potash .....	....	....	48.00
Kainit .....	....	....	12.00
Dixie Prepared Agricultural Lime .....	....	....	2.50

*Dixie Guano Co., Inc., Suffolk, Va.—*

Dixie Acid Phosphate .....	16.00	....	....
Dixie Acid Phosphate .....	14.00	....	....
Dixie Goodluck Brand .....	12.00	1.00	6.00
Dixie Alkaline Bone and Potash.....	11.00	....	2.00
Dixie Monticello Brand .....	10.00	1.00	2.00
Dixie Alkaline Bone and Potash.....	10.00	....	4.00
Dixie Alkaline Bone and Potash.....	10.00	....	2.00
Dixie's Best .....	8.00	4.11	7.00
Dixie 8-4-4 Guano .....	8.00	3.29	4.00
Dixie Maximum Brand .....	8.00	2.47	4.00
Dixie High Grade .....	8.00	2.47	3.00
Dixie 8-2-5 Guano .....	8.00	1.65	5.00
Dixie Standard Guano .....	8.00	1.65	2.00
Dixie Bonus Brand .....	8.00	1.65	2.00
Dixie Jumbo Peanut Grower .....	8.00	1.00	4.00
Dixie 5 Per Cent Truck .....	7.00	4.11	5.00
Dixie Potato Guano .....	6.00	5.75	5.00
Dixie 10 Per Cent Top Dresser.....	5.00	8.23	3.00
Dixie 7 Per Cent Guano.....	5.00	5.66	4.00
Nitrate of Soda .....	....	15.21	....
Ground Fish .....	....	8.23	....
Cotton-seed Meal .....	....	6.16	....
Muriate of Potash .....	....	....	48.00
Kainit .....	....	....	12.00

*Eastern Cotton Oil Co., Hertford, N. C.—*

Acid Phosphate .....	16.00	....	....
"Ten-One-Four for Peanuts".....	10.00	.83	4.00
Currituck Special for Yellow Sweets.....	8.00	3.29	6.00
Mat White Special .....	8.00	3.29	4.00
It-grows Currituck Yellows .....	8.00	2.47	3.00
Rain-proof Cotton Grower .....	8.00	2.47	3.00
Fish and Blood Mixture.....	8.00	1.65	2.00
Perquimans Favorite .....	8.00	1.65	2.00
Early Bird .....	7.00	4.12	5.00
Hertford Truck Grower .....	6.00	5.77	5.00
Tankage and Fish Substitute, Peruvian Guano for Truck .....	6.00	4.12	7.00
Nun-such Potato Grower .....	6.00	4.12	7.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
<i>Elmore Gin and Fertilizer Co., Elmore, N. C.—</i>			
Elmore Standard Fertilizer .....	8.00	3.29	4.00
Elmore Cotton Fertilizer .....	8.00	2.47	3.00
Elmore X Fertilizer .....	6.50	2.47	2.50
Elmore Cantaloupe Special .....	7.00	4.00	7.50
Elmore Top Dresser .....	....	8.65	3.50
Elmore Money Maker Top Dresser.....	....	7.41	6.00
Elmore Corn Fertilizer .....	....	3.70	7.50
<i>Etiwan Fertilizer Co., Charleston, S. C.—</i>			
Etiwan 16 Per Cent Acid Phosphate.....	16.00	....	....
Etiwan High Grade Acid Phosphate.....	14.00	....	....
Etiwan Dissolved Bone .....	13.00	....	....
Diamond Soluble Bone .....	13.00	....	....
Etiwan Acid Phosphate with Potash.....	11.00	....	1.00
Plow Brand Acid Phosphate with Potash....	11.00	....	1.00
Etiwan Potash Bone .....	10.00	....	4.00
Etiwan Soluble Bone with Potash.....	10.00	....	3.00
Diamond Soluble Bone with Potash.....	10.00	....	2.00
XX Acid Phosphate with Potash.....	10.00	....	2.00
Etiwan Blood and Bone Guano.....	9.00	2.06	1.00
Plow Brand Raw Bone Superphosphate.....	9.00	2.06	1.00
Etiwan 9-2-3 Per Cent Ammoniated Fertilizer.	9.00	1.65	3.00
Plow Brand Ammoniated Dissolved Bone....	9.00	1.65	2.00
Etiwan Superior Cotton Fertilizer.....	8.00	3.30	6.00
Etiwan Special Cotton Fertilizer.....	8.00	3.30	4.00
Plow Brand Special Tobacco Fertilizer.....	8.00	3.30	4.00
Etiwan Cotton Compound .....	8.00	2.47	3.00
Etiwan High Grade Cotton Fertilizer.....	8.00	2.47	2.00
Etiwan Ammoniated Fertilizer .....	8.00	1.65	2.00
Plow Brand Ammoniated Fertilizer.....	8.00	1.65	2.00
Etiwan Special Potash Mixture.....	8.00	....	4.00
Nitrate of Soda .....	....	14.82	....
Muriate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00
<i>Farmers Coöperative Fertilizer Co., Inc., Blackstone and Kenbridge, Va.—</i>			
Pure Animal Bone .....	21.00	2.47	....
F. C. F. Co.'s Acid Phosphate.....	16.00	....	....
F. C. F. Co.'s Acid Phosphate.....	14.00	....	....
Sampson .....	10.00	2.47	5.00
Pape's Peerless .....	10.00	1.64	2.00
Cherokee .....	10.00	1.03	....
F. C. F. Co.'s Bone and Potash Compound...	10.00	....	4.00
F. C. F. Co.'s Bone and Potash Compound...	10.00	....	2.00
Walkover .....	9.00	1.03	1.00
Virginian .....	8.00	3.99	2.00
Virginian X .....	8.00	3.29	4.00
Meherrin .....	8.00	2.47	3.00
Nottoway Special .....	8.00	2.47	2.00
Free State Official .....	8.00	2.06	3.00
Paul Jones .....	8.00	1.64	2.00
<i>Farmers Cotton Oil Co., Wilson, N. C.—</i>			
16 Per Cent Acid Phosphate .....	16.00	....	....
Bonum Acid Phosphate .....	14.00	....	....
Contentnea Acid Phosphate .....	13.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Washington's Corn Mixture Guano.....	10.00	1.65	5.00
Xtra Good Bone and Potash.....	10.00	....	2.00
Whitley's Special Guano .....	9.00	3.30	4.00
Dean's Special Guano .....	8.00	3.70	7.00
Regal Tobacco Guano .....	8.00	2.88	5.00
Newsome's Tobacco Special .....	8.00	2.47	4.00
Graves' Cotton Grower Guano.....	8.00	2.47	3.00
Golden Gem Guano .....	8.00	2.47	3.00
Wilson High Grade Guano .....	8.00	2.27	2.00
Planters' Friend Guano .....	8.00	2.06	3.00
Carolina Choice Tobacco Guano.....	8.00	2.06	3.00
Crop King Guano .....	8.00	1.65	2.00
Farmers' Special Guano .....	8.00	1.65	2.00
Rogers' Truck Grower .....	7.00	5.76	7.00
Wilson Top Dresser .....	2.00	9.05	4.00
Perfect Top Dresser .....	2.00	8.23	5.00
Sulphate of Ammonia .....	....	20.57	....
Nitrate of Soda .....	....	15.63	....
Nitrate Special .....	....	10.66	4.00
Tomlinson's Nitrate Special .....	....	9.87	5.00
Sulphate of Potash .....	....	....	50.00
Muriate of Potash .....	....	....	50.00
German Kaiuit .....	....	....	12.00

*Farmers Guano Co., Raleigh, N. C., and Norfolk, Va.—*

Raw Bone Meal .....	Total	45.00	3.70	....
16 Per Cent Acid Phosphate.....		16.00	....	....
14 Per Cent Acid Phosphate.....		14.00	....	....
Farmers Acid Phosphate .....		13.00	....	....
Special H. G. Bone and Potash.....		11.00	....	5.00
Farmers Grain Grower .....		10.00	1.03	2.00
Special Bone and Potash Mixture.....		10.00	....	4.00
Century Bone and Potash Mixture.....		10.00	....	2.00
Farmers Meal and Tankage Mixture.....		8.00	3.29	4.00
Farmers Blood and Bone.....		8.00	3.29	4.00
Big Crop Guano .....		8.00	2.88	5.00
Farmers Formula for Tobacco .....		8.00	2.47	3.00
Money Point Guano .....		8.00	2.47	3.00
Golden Grade Guano .....		8.00	2.47	3.00
Toco Tobacco Guano .....		8.00	2.06	3.00
Farmers 8-2-5 Guano .....		8.00	1.65	5.00
Farmers Ammoniated Guano .....		8.00	1.65	2.00
State Standard Guano .....		8.00	1.65	2.00
Farmers Peanut Guano .....		8.00	1.03	4.00
Special Bone and Potash.....		8.00	....	4.00
Farmers 7-7-7 Per Cent Trucker.....		7.00	5.76	7.00
Farmers 7-5-8 Special .....		7.00	4.12	8.00
Farmers Challenge .....		7.00	4.12	5.00
Farmers 6-7-5 Trucker .....		6.00	5.76	5.00
Farmers Top Dresser .....		3.00	8.23	4.00
Nitrate of Soda .....		....	15.63	....
Kanona Tankage .....		....	9.04	....
Muriate of Potash .....		....	....	50.00
Sulphate of Potash .....		....	....	50.00
Genuine German Kaiuit .....		....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
<i>Farmers Guano Works, Dillard, Ga.—</i>			
High Grade Dissolved Acid 16 Per Cent.....	16.00	....	....
High Grade Compost Mixture.....	13.00	....	7.00
High Grade Corn Grower.....	12.00	.82	5.00
Special for Wheat .....	12.00	....	5.00
Mack's Special Double Potash Formula.....	11.00	1.65	6.00
Special for Corn .....	10.00	1.65	4.00
Small Grain Compound .....	10.00	....	4.00
Special Mixture for Potatoes.....	8.00	.82	7.00
High Grade Vegetable Compound.....	8.00	....	6.00
Oats Special Mixture .....	8.00	....	5.00
Nitrate of Soda .....	....	15.00	....
Sulphate Potash .....	....	....	50.00
Muriate Potash .....	....	....	50.00
<i>Farmville Oil and Fertilizer Co., Farmville, N. C.—</i>			
Chamblee & Sons H. G. for Tobacco.....	8.00	2.47	5.00
<i>Federal Chemical Co., Columbia, Tenn.—</i>			
Tennessee Brown Phosphate Rock.....Total	29¾	....	....
<i>Fremont Oil Mills, Fremont, N. C.—</i>			
16 Per Cent Acid Phosphate.....	16.00	....	....
Fremont High Grade Bone and Potash.....	10.00	....	4.00
S. H. & Co.'s 8-4-4.....	8.00	3.29	4.00
Fremont High Grade Guano .....	8.00	3.29	4.00
8-3-5 Compound .....	8.00	2.47	5.00
Fremont Oil Mill Co.'s Special Tobacco.....	8.00	2.47	5.00
Nahunta Special .....	8.00	2.47	3.00
S. H. & Co.'s 8-3-3.....	8.00	2.47	3.00
Square Deal .....	8.00	2.05	3.00
Up-to-date .....	8.00	1.65	2.00
F. O. M. Co. Top Dresser.....	3.00	7.40	5.00
Nitrate of Soda .....	....	14.85	....
Muriate of Potash .....	....	....	48.00
Sulphate of Potash .....	....	....	48.00
Kainit .....	....	....	12.00
<i>General Manufacturing Co., Norfolk, Va.—</i>			
Acid Phosphate .....	16.00	....	....
Acid Phosphate .....	14.00	....	....
Potash and Soluble Bone.....	12.00	....	5.00
Potash and Soluble Bone.....	12.00	....	3.00
Potash and Soluble Bone.....	10.00	....	5.00
Potash and Soluble Bone.....	10.00	....	4.00
Potash and Soluble Bone.....	10.00	....	2.00
H. G. Cotton and Tobacco Guano.....	8.00	3.28	4.00
Manure Substitute .....	8.00	3.28	4.00
Organic Cotton Grower .....	8.00	2.46	3.00
Big Crop Grower .....	8.00	1.65	2.00
Special Peanut Grower .....	8.00	1.03	4.00
Royal Crop Grower .....	8.00	1.03	4.00
Special Peanut Grower .....	8.00	1.00	4.00
Royal Crop Grower .....	8.00	1.00	4.00
Blood, Bone and Potash.....	7.00	4.10	8.00
Special 7 Per Cent Trucker.....	6.00	5.74	5.00
Special Potato Grower .....	6.00	4.10	7.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Virginia Trucker .....	6.00	3.38	4.00
Nitrate of Soda .....	....	15.23	....
Muriate of Potash .....	....	....	50.00
Kainit .....	....	....	12.00
<i>General Manufacturing Co., Norfolk, Va., and New Bern, N. C.—</i>			
Acid .....	....	....	....
<i>Georgia Chemical Works, Augusta, Ga.—</i>			
High Grade Dissolved Bone Phosphate.....	16.00	....	....
Extra Dissolved Bone Phosphate.....	14.00	....	....
Dissolved Bone Phosphate .....	13.00	....	....
Georgia Bone and Potash.....	12.00	....	6.00
12 Per Cent Dissolved Bone Phosphate.....	12.00	....	....
High Grade XX Acid Phosphate with Potash.	10.00	....	4.00
Bone and Potash .....	10.00	....	2.00
Carolina Special Cotton Grower.....	9.00	2.47	4.00
Mascot Blood and Bone Guano.....	9.00	2.47	3.00
Bumper Tobacco Grower .....	9.00	1.85	4.00
Good as Gold Guano.....	9.00	1.65	3.00
Gem Crop Grower .....	9.00	1.65	2.00
Georgia Belle Compound .....	9.00	.82	2.00
Cardinal High Grade .....	8.00	3.29	4.00
Intensive Formula .....	8.00	2.47	3.00
Golden Leaf Special Tobacco Compound....	8.00	2.47	3.00
Three Oaks High Grade Guano.....	8.00	2.47	2.00
Thunderbolt Tobacco Special .....	8.00	2.06	3.00
Georgia Formula .....	8.00	1.65	2.00
XXX Meal Mixture .....	8.00	1.65	2.00
Georgia Special Tobacco .....	8.00	1.65	2.00
Georgia Special Wheat and Corn Grower....	8.00	.82	4.00
Acid Phosphate with 4 Per Cent Potash.....	8.00	....	4.00
Nitrate of Soda .....	....	14.82	....
Cotton-seed Meal .....	....	6.18	....
Muriate of Potash .....	....	....	48.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00
<i>Griffith &amp; Boyd Co., Baltimore, Md.—</i>			
High Grade 16 Per Cent Acid Phosphate....	16.00	....	....
Grower's Favorite .....	8.00	3.30	4.00
Farmers' Potato Manure .....	8.00	.82	9.00
Fish, Bone, and Potash.....	7.25	1.50	3.00
7 Per Cent Guano.....	5.00	5.75	5.00
<i>Hadley, Harris &amp; Co., Inc., Wilson, N. C.—</i>			
Golden Weed Tobacco Grower.....	8.00	2.47	3.00
Hadley Boss Guano .....	8.00	2.26	2.50
Daisy Fish Mixture .....	8.00	1.65	2.00
Harris' Java Tobacco Guano.....	7.00	3.30	7.00
Harris' Electric Top Dresser .....	2.90	8.22	3.00
<i>Hampton Guano Co., Norfolk, Va.—</i>			
Pure Ground Bone .....	Total	20.00	3.70
Supreme Acid Phosphate .....	16.00	....	....
Hampton Acid Phosphate .....	14.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Hampton 12-5 Bone and Potash.....	12.00	....	5.00
Hampton Bone and Potash Mixture.....	11.00	....	2.00
Hampton Crop Grower .....	10.00	....	4.00
Dauntless Potash Mixture .....	10.00	....	2.00
Arlington Animal Bone Fertilizer.....	9.00	1.85	4.00
Alpha Crop Grower .....	8.50	2.06	2.50
Hampton H. G. Tobacco Grower.....	8.00	3.29	4.00
Little's Favorite Crop Grower .....	8.00	3.29	4.00
Hampton Tobacco Guano .....	8.00	2.47	3.00
P. P. P. Princess Prolific Producer.....	8.00	2.47	3.00
Extra Tobacco Guano .....	8.00	1.65	2.00
Shirley Superphosphate .....	8.00	1.65	2.00
Hampton Special Grain and Peanut Fertilizer.	8.00	1.00	4.00
Excelsior Bone and Potash .....	8.00	....	4.00
Reliance Truck Guano .....	7.00	4.11	5.00
Virginia Truck Grower .....	6.00	5.76	5.00
Hampton 10 Per Cent Truck Grower.....	5.00	8.23	3.00
Hampton Top Dresser .....	4.00	8.23	2.00
Nitrate of Soda .....	....	15.00	....
Dry Ground Fish .....	....	8.23	....
Special Top Dresser .....	....	7.41	3.00
Muriate of Potash .....	....	....	49.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00

*S. B. Harrell & Co., Inc., Norfolk, Va.—*

Harrell's Acid Phosphate .....	14.00	....	....
Harrell's Eclipse .....	9.00	2.26	2.00
Harrell's Champion Cotton and Peanut Grower .....	8.00	1.65	2.00
Harrell's Truck Guano .....	6.00	5.76	5.00

*Home Fertilizer and Chemical Co., Baltimore, Md.—*

Eclipse Dissolved Phosphate .....	16.00	....	....
Home High Grade Acid Phosphate.....	14.00	....	....
Home Dissolved Animal Bone.....	12.00	1.65	....
Gilt Edge Crop Grower.....	10.00	1.65	4.00
Eclipse Blood, Beef and Bone.....	10.00	1.23	3.00
Home Bone and Potash .....	10.00	....	5.00
Home Alkaline Bone .....	10.00	....	2.00
Home Ammoniated Bone .....	9.00	1.65	3.00
Home B. G. Ammoniated Compound.....	9.00	.82	5.00
Everybody's Fertilizer .....	9.00	.82	2.00
Home Standard Guano .....	8.00	3.30	4.00
Eclipse Dissolved Bone and Potash.....	8.00	2.48	4.00
Riosa Tobacco Compound .....	8.00	2.48	3.00
Special C. & C. Compound.....	8.00	2.48	3.00
Yancey's Formula for Yellow Leaf Tobacco..	8.00	2.48	2.00
Phoenix Crop Grower .....	8.00	2.48	2.00
Home Potato Special .....	8.00	1.65	10.00
Matchless Guano .....	8.00	1.65	4.00
Home Cereal Fertilizer .....	8.00	1.65	2.00
Ammoniated Bone Manure .....	7.00	1.65	5.00
Farmer's Choice .....	7.00	.82	4.00
Trucker's Special Compound .....	6.00	5.77	5.00
Home Vegetable Fertilizer .....	6.00	4.12	6.00
Eclipse Ammoniated Compound .....	6.00	3.30	10.00
Home Potato Grower .....	6.00	3.30	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Sulphate of Ammonia .....	....	20.62	....
Nitrate of Soda .....	....	14.85	....
Cerealite Top Dressing .....	....	7.43	3.00
Home Fertilizer .....	....	5.77	7.00
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
German Kainit .....	....	....	12.00

*The Hubbard Fertilizer Co., Baltimore, Md.—*

Hubbard's 16 Per Cent Phosphate.....	16.00	....	....
Hubbard's 14 Per Cent Phosphate.....	14.00	....	....
Hubbard's Special Mixture 10 and 4.....	10.00	....	4.00
Hubbard's B. and P. 10 and 2.....	10.00	....	2.00
Hubbard's Noxall .....	8.00	3.28	4.00
Hubbard's Royal Ensign .....	8.00	2.46	4.00
Hubbard's Yellow Wrapper .....	8.00	2.46	3.00
Hubbard's Fish Compound .....	8.00	1.64	3.00
Hubbard's Exchange Guano .....	8.00	1.64	2.00
Hubbard's Southern Leader .....	7.00	3.28	5.00
Hubbard's 5 Per Cent Royal Seal.....	6.00	4.10	5.00
Hubbard's New Process Top Dresser .....	....	7.51	3.50
Pure German Kainit .....	....	....	12.40

*The Imperial Co., Norfolk, Va.—*

Imperial Pure Ground Bone .....Total	20.00	3.70	....
Imperial High Grade Tennessee Acid Phosphate .....	16.00	....	....
Imperial High Grade Acid Phosphate.....	14.00	....	....
Imperial Special Potash Mixture .....	12.00	....	5.00
Imperial Catawba Wheat Grower .....	10.00	....	4.00
Imperial Carolina Wheat Mixture .....	10.00	....	3.00
Imperial Virginia Grain Mixture .....	10.00	....	2.00
Imperial Bone and Potash .....	10.00	....	2.00
Imperial Martin County Special Crop Grower .....	9.00	2.26	2.00
Imperial Crop Grower .....	9.00	1.65	4.00
Imperial Snowflake Cotton Grower .....	8.00	3.29	4.00
Imperial Tobacco Grower .....	8.00	3.29	4.00
Imperial Robeson County Special .....	8.00	2.47	4.00
Imperial X. L. O. Cotton Guano.....	8.00	2.47	3.00
Imperial Tobacco Guano .....	8.00	2.47	3.00
Imperial Yellow Bark Sweet Potato Guano..	8.00	2.47	3.00
Imperial Pee Dee Cotton Grower.....	8.00	2.47	3.00
Imperial F. and B. Cotton Guano.....	8.00	2.06	3.00
Imperial Bright Tobacco Guano .....	8.00	2.06	3.00
Imperial Tennessee Tobacco Guano .....	8.00	1.65	8.00
Imperial Peanut Guano .....	8.00	1.65	4.00
Imperial Cotton Grower .....	8.00	1.65	2.00
Imperial Champion Guano .....	8.00	1.65	2.00
Imperial Peanut and Corn Guano .....	8.00	1.65	2.00
Imperial Cisco Soluble Guano .....	8.00	1.65	2.00
Imperial Standard Premium Guano .....	8.00	1.65	2.00
Imperial Ammoniated Guano .....	8.00	1.00	4.00
Imperial Fish and Bone Grain Grower.....	8.00	.82	4.00
Imperial Yadkin Wheat Grower .....	8.00	....	4.00
Imperial 7-7-7 Potato Guano.....	7.00	5.76	7.00
Imperial High Grade Irish Potato Guano....	7.00	4.11	8.00
Imperial Dawson's Cotton Grower .....	7.00	2.67	2.75
Imperial Roanoke Crop Grower .....	7.00	2.47	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Imperial Asparagus Mixture .....	6.00	4.94	7.00
Imperial 5-6-7 Potato Guano .....	6.00	4.11	7.00
Imperial Williams' Special Potato Guano....	6.00	4.11	5.00
Imperial Fish and Bone .....	6.00	3.29	4.00
Imperial Sweet Potato Guano .....	6.00	1.65	6.00
Imperial 10 Per Cent Guano .....	5.00	8.23	2.50
Imperial Ammonia Top Dresser for Spinach.	5.00	8.23	....
Imperial Special 7 Per Cent for Potatoes....	5.00	5.76	5.00
Imperial Eastern Shore Sweet Potato Special	5.00	3.29	9.00
Imperial Special Tobacco Guano .....	5.00	3.29	9.00
Imperial Top Dresser for Cotton .....	4.00	8.23	2.00
Imperial Laughinghouse Special Tobacco Guano .....	4.00	3.29	6.00
Imperial Conetoe Cotton Grower .....	4.00	3.29	4.00
Imperial Cubanola Tobacco Guano .....	4.00	2.47	5.00
Imperial Nitrate of Soda .....	....	15.00	....
Imperial Top Dresser .....	....	7.40	3.00
Imperial Dry Ground Fish.....	....	8.23	....
Imperial Muriate of Potash .....	....	....	49.00
Imperial Sulphate of Potash .....	....	....	48.00
Imperial Genuine German Kainit .....	....	....	12.00

*N. B. Josey Guano Co., Tarboro, N. C.—*

Josey's 16 Per Cent Acid Phosphate.....	16.00	....	....
Josey's Bone and Potash.....	10.00	....	4.00
Josey's Truck Guano .....	8.00	4.10	5.00
Josey's Big Yield Guano .....	8.00	3.30	4.00
Josey's 8-4-4 C. S. Meal and Fish Scrap Guano	8.00	3.30	4.00
Josey's Special Tobacco Guano .....	8.00	2.47	5.00
Josey's Tip Top C. S. Meal and Fish Scrap Guano .....	8.00	2.47	3.00
Josey's Bright Leaf Tobacco Guano.....	8.00	2.47	3.00
Josey's "U No" Guano .....	8.00	2.47	3.00
Josey's Quick Step Tobacco Guano.....	8.00	2.06	3.00
Josey's Favorite C. S. Meal and Fish Scrap Guano .....	8.00	2.05	2.50
Josey's C. S. Meal Guano .....	8.00	1.65	2.00
Josey's Potato Guano .....	7.00	5.77	7.00
Josey's ("Big Four") C. S. M. and F. S. Guano	6.00	3.30	4.00
Josey's Peanut Guano .....	5.50	1.23	5.50
Josey's Elite Top Dresser .....	3.00	7.42	4.00
Nitrate of Soda .....	....	15.50	....
Josey's Top Dresser .....	....	7.42	4.00
Cotton-seed Meal .....	....	6.19	....
Muriate of Potash .....	....	....	48.00
Manure Salts .....	....	....	20.00
Genuine German Kainit .....	....	....	12.00

*Lister's Agricultural Chemical Works, Newark, N. J.—*

Lister's H. G. Phosphoric Acid Phosphate....	16.00	....	....
Lister's Buyers Choice Acid Phosphate.....	14.00	....	....
Lister's Phosphoric Acid and Phosphate.....	10.00	....	4.00
Lister's Dissolved Phosphate and Potash....	10.00	....	2.00
Lister's Carolina Bright for Tobacco.....	9.00	2.47	3.00
Lister's Standard Pure Bone Superphosphate of Lime .....	9.00	1.65	2.00
Lister's Complete Manure .....	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Lister's Special Tobacco Fertilizer .....	8.00	2.06	3.00
Lister's Ammoniated Dissolved Bone Phosphate .....	8.00	2.06	2.00
Lister's Success Fertilizer .....	8.00	1.65	2.00
<i>John F. McNair, Laurinburg, N. C.—</i>			
Nitrate of Soda .....	....	15.20	....
Muriate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00
<i>McNair Phosphate Co., Laurinburg, N. C.—</i>			
Rob Roy .....	8.00	5.76	5.00
Sodash .....	2.00	7.29	5.00
<i>The MacMurphy Co., Charleston, S. C.—</i>			
High Grade Acid Phosphate, 14 Per Cent....	14.00	....	....
Acid Phosphate .....	13.00	....	....
Acid Phosphate and Potash.....	12.00	....	1.00
Acid Phosphate and Potash.....	11.00	....	1.00
Acid Phosphate and Potash.....	10.00	....	5.00
Acid Phosphate and Potash.....	10.00	....	4.00
Acid Phosphate and Potash.....	10.00	....	2.00
Wilcox & Gibbs Co.'s Manipulated Guano....	9.25	2.26	2.00
Special 8-4-6 Guano .....	8.00	3.29	6.00
Special 8-4-4 Cotton Guano.....	8.00	3.29	4.00
Special 8-4-4 Tobacco Guano.....	8.00	3.29	4.00
Special 8-3-4 Tobacco Guano.....	8.00	2.47	4.00
Special 8-3-3 Cotton and Corn.....	8.00	2.47	3.00
Special 8-3-3 Tobacco Guano.....	8.00	2.47	3.00
Standard 8-2½-1 Cotton Guano.....	8.00	2.06	1.00
Special 8-2-2 Cotton Guano.....	8.00	1.65	2.00
Special 9.25-2-2 Cotton and Corn Guano.....	2.25	1.65	2.00
Nitrate of Soda .....	....	14.81	....
Muriate of Potash .....	....	....	48.00
Sulphate of Potash .....	....	....	48.00
<i>The Mapes Formula and Peruvian Guano Co., Newark, N. J.—</i>			
Mapes' Complete Manure, "A" Brand.....	10.00	2.47	2.50
Mapes' Corn Manure .....	8.00	2.47	6.00
Mapes' Vegetable or Complete Manure for Light Soils .....	6.00	4.94	6.00
Mapes' Economical Potato Manure.....	4.00	3.29	8.00
<i>Marietta Fertilizer Co., Atlanta, Ga.—</i>			
Marietta Blood and Bone Special.....	9.00	.82	3.00
Marietta Beef Blood and Bone.....	9.00	.82	2.00
Fertilizer, No. 835 .....	8.00	2.47	5.00
5 Per Cent Trucker.....	6.00	4.11	7.00
<i>Martin Fertilizer Co., Norfolk, Va., and New Bern, N. C.—</i>			
Martin's Pure Ground Bone .....	22.00	2.46	....
Martin's Raw Bone Meal .....	21.00	3.70	....
Martin's Acid Phosphate .....	16.00	....	....
Martin's Acid Phosphate .....	14.00	....	....
Martin's Pure Dissolved Animal Bone.....	12.00	1.65	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Martin's Potash and Soluble Bone.....	12.00	....	5.00
Martin's Potash and Soluble Bone.....	12.00	....	3.00
Martin's Potash and Soluble Bone.....	10.00	....	6.00
Martin's Potash and Soluble Bone.....	10.00	....	5.00
Martin's Potash and Soluble Bone.....	10.00	....	4.00
Jennett's Potash and Soluble Bone.....	10.00	....	4.00
Martin's Potash and Soluble Bone.....	10.00	....	3.00
Martin's Potash and Soluble Bone.....	10.00	....	2.00
Jennett's Potash and Soluble Bone.....	10.00	....	2.00
Martin's Tobacco Special .....	9.00	2.46	3.00
Martin's Cotton Special .....	9.00	2.46	3.00
Martin's Tobacco Compound .....	9.00	2.26	2.00
Johnson's High Grade .....	9.00	2.05	5.00
Martin's Dissolved Organic Compound .....	9.00	1.00	3.00
Martin's Corn and Cereal Special.....	9.00	1.00	2.00
Martin's High Grade Guano .....	8.75	1.65	2.00
Martin's Blood, Bone and Potash.....	8.00	4.10	7.00
Martin's Red Star Brand Fertilizer.....	8.00	4.10	5.00
Special Fertilizer .....	8.00	3.28	6.00
Martin's Cotton and Tobacco Guano.....	8.00	3.28	6.00
Martin's Cotton Guano .....	8.00	3.28	4.00
Martin's Red Star Brand .....	8.00	3.28	4.00
Martin's Tobacco Special .....	8.00	3.28	4.00
Jennett's Cotton Guano .....	8.00	3.28	4.00
Martin's Blue Ribbon Brand Fertilizer.....	8.00	3.28	2.00
Martin's Bull Head Fertilizer .....	8.00	2.46	8.00
Martin's Cotton and Tobacco Guano.....	8.00	2.46	5.00
Privott's Favorite .....	8.00	2.46	4.00
Martin's Bull Head .....	8.00	2.46	3.00
Martin's Tobacco Special .....	8.00	2.46	3.00
Jennett's Slaughter House Mixture.....	8.00	2.46	3.00
Martin's Meal Mixture .....	8.00	2.46	3.00
Martin's Tobacco Special .....	8.00	2.06	5.00
Martin's Meal Mixture .....	8.00	2.06	4.00
Martin's Meal Mixture .....	8.00	2.05	4.00
Martin's Special Fertilizer .....	8.00	2.05	3.00
Martin's Cotton Guano .....	8.00	2.05	1.00
Privott's Special for Potatoes and Peanuts..	8.00	1.65	6.00
Martin's Cotton and Tobacco Guano.....	8.00	1.65	5.00
Martin's Cotton and Tobacco Guano.....	8.00	1.65	3.00
Martin's Animal Organic Compound .....	8.00	1.65	3.00
Martin's Slaughter House Special .....	8.00	1.65	2.00
Martin's Wheat Special .....	8.00	1.65	2.00
Martin's Carolina Special for Tobacco.....	8.00	1.65	2.00
Martin's Carolina Cotton .....	8.00	1.65	2.00
Martin's Corn and Cereal Special.....	8.00	1.65	2.00
Martin's Old Virginia Favorite .....	8.00	1.65	2.00
Jennett's Beef Blood and Bone.....	8.00	1.65	2.00
Martin's One Eight Four .....	8.00	1.03	4.00
Martin's Peanut Grower .....	8.00	1.03	4.00
Martin's Potash and Soluble Bone.....	8.00	....	4.00
Martin's Top Dresser .....	7.00	8.22	2.50
Martin's Red Star Brand Fertilizer.....	7.00	4.10	5.00
Abbott's Special .....	7.00	3.28	8.00
Martin's Gilt Edge Potato Manure.....	7.00	2.46	10.00
Martin's 7 Per Cent Guano.....	6.00	5.74	5.00
Martin's Animal Bone Potato Fertilizer....	6.00	4.10	7.00
Martin's Early Truck and Vegetable Grower.	6.00	3.28	8.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Knowles' Special .....	6.00	3.28	6.00
Martin's Top Dresser .....	5.00	8.23	2.50
Martin's Nitrate Soda .....	....	15.23	....
Martin's Muriate of Potash .....	....	....	50.00
Martin's Sulphate of Potash .....	....	....	48.00
Martin's Kainit .....	....	....	48.00

*E. H. & J. A. Meadows Co., New Bern, N. C.—*

Diamond Acid Phosphate .....	16.00	....	....
Diamond Acid Phosphate .....	14.00	....	....
Meadows' Dissolved Bone and Potash Com- pound .....	10.00	....	5.00
Meadows' Dissolved Bone and Potash Com- pound .....	10.00	....	4.00
Meadows' Lobos Guano .....	8.00	4.11	5.00
Meadows' Ideal Tobacco Guano .....	8.00	3.29	4.00
Brooks' Special Tobacco Grower .....	8.00	2.47	5.00
Parker's Special Tobacco Guano.....	8.00	2.47	4.00
Meadows' Gold Leaf Tobacco Guano.....	8.00	2.47	3.00
Meadows' Roanoke Guano .....	8.00	2.05	3.00
Meadows' All Crop Guano .....	8.00	2.05	2.50
Meadows' Cotton Guano .....	8.00	1.65	2.00
Meadows' Great Cabbage Guano .....	7.00	5.76	7.00
Meadows' Great Potato Guano .....	7.00	4.11	8.00
Nitrate of Soda .....	....	15.50	....
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	50.00
Meadows' German Kainit .....	....	....	12.40

*The Miller Fertilizer Co., Baltimore, Md.—*

Miller's 16 Per Cent Acid Phosphate.....	16.00	....	....
Miller's 14 Per Cent Acid Phosphate.....	14.00	....	....
Corn and Peanut Grower .....	10.50	....	2.25
Corn and Wheat Grower.....	10.50	....	2.25
The Miller Fertilizer Co.'s 10 and 4 Per Cent. Clinch .....	10.00	....	4.00
Trucker .....	10.00	....	2.00
No. 1 Potato and Vegetable Grower.....	8.00	4.12	5.00
Miller's Irish Potato .....	8.00	3.71	7.00
4 Per Cent Tobacco .....	8.00	3.29	4.00
Standard Phosphate .....	8.00	3.29	4.00
Tobacco King .....	8.00	2.47	3.00
Miller's High Grade .....	8.00	2.47	3.00
Special Tobacco Grower .....	8.00	2.06	3.00
Potato and Vegetable Gnano.....	8.00	1.65	4.00
Ammoniated Dissolved Bone .....	8.00	1.65	4.00
Farmer's Profit .....	8.00	1.65	2.00
Miller's 8 and 4.....	8.00	1.65	2.00
High Grade Potato .....	8.00	....	4.00
Special .....	6.00	4.12	7.00
Nitrate of Soda .....	4.00	6.58	3.00
Muriate of Potash .....	....	15.05	....
Sulphate of Ammonia .....	....	....	50.00
	....	....	48.00

*Navassa Guano Co., Wilmington, N. C.—*

Navassa Piedmont Wheat Grower.....	10.00	....	2.00
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Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
<i>New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.—</i>			
Thomas Phosphate .....Total	18.00	....	....
Bone Meal .....Total	16.00	2.47	....
16 Per Cent Acid Phosphate.....	16.00	....	....
14 Per Cent Acid Phosphate.....	14.00	....	....
Special Corn and Peanut Grower.....	11.00	....	2.00
High Grade Bone and Potash.....	10.00	....	4.00
Carteret Bone and Potash .....Total	10.00	....	2.00
Greene County Tobacco Fertilizer.....	9.00	2.47	5.00
Sparrow's Special Tobacco Grower.....	9.00	2.47	3.00
Oriole Tobacco Grower .....	8.00	3.30	4.00
Harvey's Special Meal and Fish Guano.....	8.00	2.47	3.00
Special C. S. M. Mixture.....	8.00	2.47	3.00
Foy's High Grade Fertilizer.....	8.00	2.47	3.00
Lenoir Bright Leaf Tobacco Grower.....	8.00	2.47	3.00
Pitt's Prolific Golden Tobacco Guano.....	8.00	2.47	3.00
Favorite Cotton Grower .....	8.00	2.27	2.00
Onslow's Farmers' Reliance Guano.....	8.00	2.06	3.00
Jones County Premium Crop Grower.....	8.00	2.06	3.00
Craven Cotton Guano .....	8.00	1.65	2.00
Greene County Standard Fertilizer.....	8.00	1.65	2.00
Dunn's Standard Truck Grower.....	7.00	5.77	7.00
Ives' Irish Potato Guano .....	7.00	4.12	7.00
Eureka Tobacco Fertilizer .....	6.00	3.30	7.00
Hart's Special Tobacco Grower.....	6.00	2.47	6.00
Pamlico Electric Top Dresser.....	5.00	8.25	2.50
Wooten's Special Tobacco Guano.....	4.00	3.30	6.00
Sulphate of Ammonia .....	....	20.62	....
Nitrate of Soda .....	....	15.67	....
Ground Blood .....	....	13.20	....
Ground Tankage .....	....	9.00	....
Eureka Top Dresser .....	....	8.25	3.00
High Grade Fish Scrap .....	....	8.25	....
Cotton-seed Meal .....	....	6.18	....
Sulphate of Potash .....	....	....	50.00
Muriate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00
<i>Nitrate Agencies Co., New York, Baltimore, Savannah, Charleston, and Norfolk—</i>			
Acid Phosphate .....	16.00	....	....
Basic Slag .....Total	14.00	....	....
Ground Fish .....	7.00	9.35	....
Nitrate of Soda .....	....	15.00	....
Ground Dried Blood .....	....	13.16	....
Ground Tankage .....	....	9.04	....
Muriate of Potash .....	....	....	48.00
Sulphate of Potash .....	....	....	47.00
Kainit .....	....	....	12.00
<i>Norfolk Fertilizer Co., Norfolk, Va.—</i>			
Pure Ground Bone .....Total	20.00	3.70	....
Oriana 16 Per Cent Acid Phosphate.....	16.00	....	....
Whitney H. G. Acid Phosphate .....	16.00	....	....
Oriana 14 Per Cent Acid Phosphate.....	14.00	....	....
Oriana Wheat Grower .....	10.00	....	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Shenandoah Wheat Mixture .....	10.00	....	3.00
Young's Grain Grower .....	10.00	....	2.00
Oriana Bone and Potash .....	10.00	....	2.00
Oriana C. S. M. Special .....	9.00	2.26	2.00
Oriana Complete Fertilizer .....	8.00	3.29	4.00
Oriana First Step Tobacco Guano.....	8.00	3.29	4.00
Oriana Tobacco Guano .....	8.00	2.47	3.00
Oriana for Cotton .....	8.00	2.47	3.00
Oriana Bright Leaf Guano .....	8.00	2.06	3.00
Oriana Cotton Guano .....	8.00	1.65	2.00
Oriana Crop Grower .....	8.00	1.65	2.00
Mayodan Valley Wheat Grower.....	8.00	....	4.00
Oriana Special Mixture .....	6.00	4.11	5.00
Oriana Truck Guano .....	5.00	5.76	5.00
Pine Top Special Crop Grower.....	5.00	1.65	6.00
Nitrate of Soda Mixture for Top Dressing Cotton .....	4.00	8.23	2.00
Oriana High Grade Tobacco Guano.....	4.00	3.29	6.00
Nitrate of Soda .....	....	15.00	....
Dry Ground Fish .....	....	8.23	....
Norfolk Top Dresser .....	....	7.40	3.00
Muriate of Potash .....	....	....	49.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00

*Norfolk Tallow Co., Norfolk, Va.—*

Natalco Ground Bone .....	8.00	2.45	....
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*North Carolina Cotton Oil Co., Charlotte, N. C.—*

Dixie Standard .....	8.00	2.48	3.00
Majestic .....	8.00	1.65	2.00

*North Carolina Cotton Oil Co., Henderson, N. C.—*

Special Mixture W. F. Marsh, Jr.....	10.00	2.47	3.00
Pride of Vance Tobacco Fertilizer.....	9.00	2.47	3.00
Unedit Tobacco Fertilizer .....	9.00	2.47	3.00
Henderson Tobacco Fertilizer .....	9.00	2.47	3.00
Franklin Tobacco Fertilizer .....	9.00	2.47	3.00
Currin's Special for Tobacco .....	8.00	3.29	4.00
Two in One .....	8.00	3.28	4.00
Sulphate of Potash Brand Tobacco Guano...	8.00	2.47	3.00
Henderson High Grade .....	8.00	2.47	3.00
McKinne Mixture .....	8.00	2.26	3.25
Henderson Standard Guano .....	8.00	2.26	2.00
Brewer's Special .....	8.00	2.26	2.00
American Pet .....	8.00	2.26	2.00
Henderson Cotton Grower .....	8.00	1.65	2.00
Franklin Cotton Grower .....	8.00	1.65	2.00
Unedit Cotton Grower .....	8.00	1.65	2.00
Vance Cotton Grower .....	8.00	1.65	2.00
Nitrate of Soda .....	....	14.80	....
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00

*North Carolina Cotton Oil Co., Raleigh, N. C.—*

Raleigh Special Guano .....	8.00	2.47	3.00
Raleigh Standard Guano .....	8.00	2.26	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
<i>North Carolina Cotton Oil Co., Wilmington, N. C.—</i>			
High Grade Acid Phosphate.....	16.00	....	....
Wilmington Bone and Potash.....	10.00	....	4.00
Pate's High Grade .....	9.00	2.47	3.00
Cockrell & Williams' Cotton Grower.....	9.00	2.27	2.00
Wilmington Mortgage Lifter .....	9.00	2.27	2.00
Wilmington's Pride .....	8.00	4.12	7.00
Wilmington's Truck Grower .....	8.00	3.30	4.00
Bullock's High Grade .....	8.00	3.30	4.00
Wilmington's Full Value .....	8.00	3.30	4.00
Wilmington Tobacco Grower .....	8.00	3.30	4.00
Wilmington Fruit Grower .....	8.00	2.47	10.00
Best Tobacco Grower .....	8.00	2.47	7.50
John's Special .....	8.00	2.47	4.00
Bullock's Cotton Grower .....	8.00	2.47	4.00
Wilmington Farmer Boy .....	8.00	2.47	4.00
Wilmington High Grade .....	8.00	2.47	3.00
Wilmington Leader .....	8.00	2.47	3.00
Clute's Cotton Grower .....	8.00	2.47	3.00
L. P. B. Special.....	8.00	2.47	3.00
Carter's Lifter .....	8.00	2.47	3.00
Lewis's Special .....	8.00	2.47	3.00
Cooper's Special .....	8.00	2.47	3.00
The Stone Company Special.....	8.00	2.47	3.00
Wilmington Standard .....	8.00	2.47	2.50
Pate's Special .....	8.00	2.47	2.00
Currie's Crop Grower .....	8.00	2.06	4.00
Wilmington Banner .....	8.00	1.65	3.00
Clark's Special .....	8.00	1.65	3.00
Maultsby's Cotton Grower .....	8.00	1.65	3.00
Wilmington Cotton Grower .....	8.00	1.65	2.00
Wilmington Special .....	8.00	1.65	2.00
Wilmington Cotton Mixture .....	7.00	2.47	5.00
High Grade Tobacco.....	6.00	3.30	10.00
Wilmington Headlight .....	6.00	3.30	8.00
Wilmington High Grade Top Dresser.....	4.50	7.40	3.00
Sulphate of Ammonia .....	....	19.68	....
Nitrate of Soda .....	....	14.80	....
Dried Blood .....	....	13.12	....
H. G. Ground Tankage.....	....	8.20	....
Wilmington Special Top Dresser.....	....	7.40	3.00
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
Kainit .....	....	....	12.00
<i>G. Ober &amp; Sons Co., Baltimore, Md.—</i>			
Pure Raw Bone Meal.....Total	21.00	3.71	....
Ober's High Grade Acid Phosphate.....	16.00	....	....
Ober's Dissolved Bone Phosphate .....	14.00	....	....
Ober's Standard Potash Compound .....	12.00	....	5.00
Ober's Dissolved Animal Bone .....	10.00	2.47	....
Ober's Acid Phosphate with Potash.....	10.00	....	4.00
Ober's Dissolved Bone, Phosphate and Potash	10.00	....	2.00
Ober's Special High Grade Fertilizer.....	9.00	2.47	3.00
Ober's Special Ammoniated Dissolved Bone..	9.00	1.65	2.00
Ober's Farmers' Mixture .....	9.00	.82	2.00
Ober's H. G. Fertilizer .....	8.00	3.30	4.00
Ober's Complete Guano for All Crops.....	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Ober's Special Compound for Tobacco.....	8.00	2.47	3.00
Cooper's Pungo .....	8.00	2.06	2.00
Ober's Standard Tobacco Fertilizer .....	8.00	1.65	2.00
Ober's Special Cotton Compound .....	8.00	1.65	2.00
Ober's Soluble Ammoniated Superphosphate of Lime .....	8.00	1.65	2.00
Ober's Stag Guano .....	8.00	.82	4.00
Ober's Acid Phosphate with Potash.....	8.00	....	4.00
Ground Fish .....	7.30	9.00	....
Ober's Complete Vegetable Fertilizer .....	7.00	4.12	5.00
Red Seal Special Tobacco Guano.....	6.00	2.47	7.00
Ober's Special Tobacco Bed Fertilizer, 10 Per Cent .....	4.00	8.25	3.00
Nitrate of Soda .....	....	15.50	....
Ground Blood .....	....	13.00	....
Sulphate of Potash .....	....	....	48.00
Muriate of Potash .....	....	....	48.00
Kainit .....	....	....	12.00

*Pan-American Fertilizer Co., Norfolk, Va.—*

Pan-American 16 Per Cent Acid Phosphate...	16.00	....	....
Pan-American 10 and 2.....	10.00	....	2.00
Pan-American Favorite Compound .....	8.00	3.29	4.00
Pan-American Special Cotton Grower.....	8.00	2.47	3.00
Pan-American Universal Phosphate .....	8.00	1.65	2.00
Pan-American Special .....	7.00	5.76	5.00
Pan-American 6 Per Cent Trucker.....	7.00	4.94	5.00
Pan-American P. Trucker .....	6.00	5.76	6.00
Pan-American Universal Trucker .....	6.00	5.76	5.00
Pan-American Carolina Trucker .....	6.00	4.11	7.00
Pan-American Dixie Standard .....	6.00	4.11	5.00
Pan-American Tip Top Dresser .....	5.00	8.23	2.00
Pan-American Potato and Truck Special.....	5.00	5.76	5.00
Pan-American Universal Top Dresser.....	3.00	8.23	4.00

*Patapsco Guano Co., Baltimore, Md.—*

Patapsco Pure Raw Bone..... Total	21.51	3.70	....
Florida Soluble Phosphate .....	16.00	....	....
Patapsco Pure Dissolved S. C. Phosphate....	14.00	....	....
Patapsco High Grade Phosphate and Potash.	11.00	....	5.00
Baltimore Soluble Phosphate .....	11.00	....	2.00
Patapsco 10 and 4 Potash Mixture.....	10.00	....	4.00
Patapsco Soluble Phosphate and Potash.....	10.00	....	2.00
Patapsco Guano for Tobacco .....	9.25	2.06	2.00
Patapsco Guano .....	9.25	2.06	2.00
Patapsco Tobacco Fertilizer .....	9.00	2.47	3.00
Patapsco Bright Tobacco Grower .....	9.00	2.26	2.00
Patapsco Cotton and Corn Special.....	9.00	2.06	5.00
Patapsco Cotton Growers' Special .....	9.00	1.65	3.00
Coon Brand Guano .....	9.00	.82	3.00
Patapsco Cotton and Tobacco Special.....	8.00	3.29	4.00
Patapsco Plant Food for Tobacco, Potatoes and Truck .....	8.00	2.47	5.00
Patapsco Gold Leaf C. S. M. Mixture.....	8.00	2.47	3.00
Choctaw Guano .....	8.00	2.47	3.00
Patapsco H. G. Tobacco Special.....	8.00	2.47	3.00
Patapsco Special Tobacco Mixture .....	8.00	2.06	3.00
Unicorn Guano .....	8.00	2.06	3.00
Planters Favorite .....	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Grange Mixture, C. S. M. Base.....	8.00	1.65	2.00
Sea Gull Ammoniated Guano.....	8.00	1.65	2.00
Patapsco 7-7-7 Truck Guano.....	7.00	5.76	7.00
Patapsco Trucker for Early Vegetables.....	7.00	4.11	5.00
Money Maker Guano .....	7.00	3.70	6.00
Dry Ground Fish .....	6.00	8.23	....
Patapsco Potato Guano .....	6.00	4.11	7.00
Patapsco Crop Dresser .....	4.00	3.29	4.00
Nitrate of Soda .....	....	15.00	....
Patapsco Top Dresser .....	....	7.41	3.00
Muriate of Potash .....	....	....	49.00
Genuine German Kainit .....	....	....	12.00

*Peruvian Guano Corporation, Charleston, S. C.—*

Peruvian Sulphate Tobacco Formula.....	10.00	1.65	8.00
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*The Phosphate Mining Co., Goronah, Ga.—*

"Supreme" Acid Phosphate .....	18.00	....	....
Acid Phosphate .....	17.00	....	....
"Superfine" Acid Phosphate .....	16.00	....	....
Acid Phosphate .....	15.00	....	....
"Superior" Acid Phosphate .....	14.00	....	....
Acid Phosphate .....	13.00	....	....
Acid Phosphate .....	12.00	....	....

*Piedmont-Mt. Airy Guano Co., Baltimore, Md.—*

Piedmont Bone Meal .....	21.00	3.29	....
Piedmont 16 Per Cent Acid Phosphate.....	16.00	....	....
Piedmont 14 Per Cent Acid Phosphate.....	14.00	....	....
Piedmont Special Potash Mixture .....	10.00	....	5.00
Levering's Potashed Bone .....	10.00	....	4.00
Piedmont Farmers' Potash Mixture .....	10.00	....	2.00
Piedmont Farmers' Standard .....	9.00	1.65	2.00
Piedmont Essential Tobacco Compound.....	9.00	1.65	2.00
Levering's Ammoniated Bone .....	9.00	.82	3.00
Piedmont Unexcelled Guano .....	8.00	3.29	4.00
Piedmont Special Tobacco Guano .....	8.00	2.47	4.00
Piedmont High Grade Ammoniated Bone and Potash .....	8.00	2.47	3.00
Levering's Reliable Tobacco Guano.....	8.00	2.47	3.00
Piedmont Guano for Tobacco .....	8.00	2.06	3.00
Piedmont Guano for All Crops .....	8.00	2.06	3.00
Levering's Standard .....	8.00	1.65	3.00
Piedmont Bone and Peruvian Mixture.....	8.00	1.65	2.00
Piedmont Cultivator Brand .....	8.00	1.65	2.00
Piedmont Red Leaf Tobacco Guano.....	8.00	1.65	2.00
Piedmont Farmers' Favorite .....	8.00	.82	4.00
Piedmont Star Bone and Potash .....	8.00	....	5.00
Piedmont 7-7-7 Truck Guano .....	7.00	5.76	7.00
Piedmont Special Truck Fertilizer .....	6.00	5.76	5.00
Piedmont Special Potato Guano .....	6.00	4.94	7.00
Piedmont Early Vegetable Manure .....	6.00	4.12	7.00
Piedmont Early Trucker .....	6.00	4.12	5.00
Piedmont Vegetable Compound .....	6.00	3.29	8.00
Piedmont 7 Per Cent Truck Guano.....	5.00	5.76	5.00
Piedmont Potato Producer .....	5.00	2.47	6.00
Nitrate of Soda .....	....	15.23	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Boykin's Top Dresser .....	....	7.41	3.00
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
German Kainit .....	....	....	12.00

*Planters Cotton Oil and Fertilizer Co., Rocky  
Mount, N. C.—*

Acid Phosphate .....	16.00	....	....
Royal Cotton Grower .....	9.00	2.26	2.00
J. P. D. Special .....	8.00	3.29	5.00
Gorham H. G. ....	8.00	3.29	4.00
Robertson's Tobacco Compound .....	8.00	2.47	5.00
Tar River Special .....	8.00	2.47	3.00
Planters' C. S. Oil Co.'s Tobacco Guano.....	8.00	2.47	3.00
Break's Corn Special .....	8.00	1.65	7.00
Planters' Pride for Cotton .....	8.00	1.65	2.00
Planters' C. S. Oil Co.'s Cotton Guano.....	8.00	1.65	2.00
Planters' Peanut Mixture .....	8.00	1.21	5.00
Planters' Special Potato Guano .....	7.00	4.12	5.00
Braswell's Excelsior .....	7.00	3.29	6.00
E. L. D. Special .....	7.00	2.47	3.00
Braswell's Special for Tobacco.....	7.00	2.26	3.50
Planters' Top Dresser .....	3.50	7.82	3.00
Nitrate of Soda .....	....	15.00	....
Ground Fish Scrap .....	....	8.23	....
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00

*Pocahontas Guano Co., Lynchburg, Va.—*

Pure Raw Bone Meal.....Total	22.00	3.71	....
Carrington's S. C. Phosphate, Waukesha Brand .....	16.00	....	....
Imperial Dissolved S. C. Phosphate.....	14.00	....	....
Indian Special Grain and Grass Guano.....	12.00	5.00	....
Special Potash Mixture .....	10.00	5.00	....
Wabash Wheat Mixture .....	10.00	4.00	....
Carrington's Superior Grain Compound.....	10.00	2.00	....
Pocahontas Special Tobacco Fertilizer.....	9.00	2.47	3.00
High Grade 4 Per Cent Tobacco Compound Mohawk King .....	9.00	1.85	4.00
Yellow Tobacco Special .....	9.00	1.65	2.00
Standard Tobacco Guano, Old Chief Brand..	9.00	1.65	2.00
Planters' Special .....	9.00	.82	2.00
Indian Tobacco Grower .....	8.00	2.47	4.00
Farmers' Favorite Apex Brand.....	8.00	2.47	3.00
Special Truck Grower, Eagle Mount Brand..	8.00	2.06	6.00
Spot Cash Tobacco Compound.....	8.00	2.05	3.00
Truckers' Special .....	8.00	1.65	6.00
Carrington's Banner Brand Guano.....	8.00	1.65	2.00
A. A. Complete Champion Brand.....	8.00	1.00	3.00
Cherokee Grain Special .....	8.00	....	4.00
Nitrate of Soda .....	....	15.00	....
Muriate of Potash .....	....	....	49.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
<i>The Pocomoke Guano Co., Norfolk, Va.—</i>			
Pure Ground Bone .....Total	20.00	3.70	....
Superb Acid Phosphate .....	16.00	....	....
Peerless Acid Phosphate .....	14.00	....	....
Pocomoke 12-5 Bone and Potash.....	12.00	....	5.00
Alkali Bone .....	11.00	....	2.00
Pocomoke Bone and Potash Mixture.....	10.00	....	4.00
10-2 Potash Mixture .....	10.00	....	2.00
Monticello Animal Bone Fertilizer.....	9.00	1.85	4.00
Cinco Tobacco Guano .....	8.50	2.06	2.50
Pocomoke Superphosphate .....	8.50	1.65	2.00
Electric Crop Grower .....	8.50	1.65	2.00
Garrett's Grape Grower .....	8.00	3.29	10.00
Faultless Ammoniated Superphosphate.....	8.00	3.29	4.00
Pocomoke H. G. Tobacco Guano.....	8.00	3.29	4.00
Monarch Tobacco Grower .....	8.00	2.47	3.00
Harvey's High Grade Monarch.....	8.00	2.47	3.00
Pocomoke Sweet Potato Grower.....	8.00	2.47	3.00
CCC Crescent Complete Compound .....	8.00	1.65	3.00
Pamlico Superphosphate .....	8.00	1.65	2.00
Pocomoke Wheat, Corn and Peanut Manure..	8.00	1.00	4.00
Pocomoke Defiance Bone and Potash.....	8.00	....	4.00
Pocomoke Truck Grower 5 Per Cent.....	7.00	4.11	5.00
Standard Truck Guano .....	7.00	4.11	5.00
Seaboard Popular Trucker .....	6.00	5.76	5.00
Freeman's 7 Per Cent Irish Potato Grower...	6.00	5.76	5.00
Coast Line Truck Guano.....	5.00	8.23	3.00
Pocomoke Top Dresser .....	4.00	8.23	2.00
Smith's Special Formula .....	4.00	3.29	6.00
Nitrate of Soda .....	....	15.00	....
Dry Ground Fish .....	....	8.23	....
Special Top Dresser .....	....	7.41	3.00
Muriate of Potash .....	....	....	49.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00

*Powhatan Chemical Co., Richmond, Va.—*

Pure Animal Bone .....Total	25.00	2.47	....
Pure Raw Bone Meal.....Total	22.50	3.70	....
Magic Dissolved Bone Phosphate.....	16.00	....	....
High Grade Acid Phosphate.....	14.00	....	....
Powhatan Acid Phosphate .....	13.00	....	....
Magic Corn Special .....	12.00	1.00	2.00
Magic Wheat Special .....	12.00	1.00	2.00
High Grade Bone and Potash Mixture.....	12.00	....	5.00
Virginia Dissolved Bone .....	12.00	....	....
Magic Corn Grower .....	10.00	.82	1.00
Magic Crop Grower .....	10.00	.82	1.00
Magic Bone and Potash Mixture.....	10.00	....	4.00
Bone and Potash Mixture .....	10.00	....	2.00
Austin's Special Fertilizer .....	9.00	2.47	6.00
Guilford Special Tobacco Fertilizer.....	9.00	2.47	6.00
Ralling's Special Fertilizer .....	9.00	2.47	2.00
Economic Cotton Grower .....	9.00	2.26	2.00
Johnson's Best Fertilizer .....	9.00	2.06	5.00
Holt's Magic Fertilizer .....	9.00	2.06	5.00
Union Magic Fertilizer .....	9.00	1.85	4.00
North Carolina Favorite .....	9.00	1.65	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Powhatan Special Fertilizer .....	9.00	1.65	2.00
Magic Mixture .....	9.00	1.65	1.00
Powhatan Grain Guano .....	9.00	.82	3.00
Magic Wheat Grower .....	9.00	.82	2.00
King Trucker .....	8.00	4.11	5.00
Tomlinson's Best Fertilizer .....	8.00	3.70	7.00
Copeland's Magic Fertilizer .....	8.00	3.29	8.00
Powhatan Special Tobacco Fertilizer.....	8.00	3.29	6.00
North State Special .....	8.00	3.29	4.00
Tomlinson's Favorite Fertilizer .....	8.00	2.88	5.00
Special Fertilizer .....	8.00	2.47	7.00
Tomlinson's Magic Fertilizer .....	8.00	2.47	7.00
Tomlinson's Special Fertilizer .....	8.00	2.47	5.00
Magic Fertilizer .....	8.00	2.47	4.00
P. C. Co.'s Hustler .....	8.00	2.47	3.00
Johnson's Special Fertilizer .....	8.00	2.47	3.00
King Brand Fertilizer .....	8.00	2.06	3.00
White Leaf Tobacco Fertilizer .....	8.00	2.06	3.00
Powhatan Peanut Fertilizer .....	8.00	1.65	4.00
Magic Cotton Grower .....	8.00	1.65	2.00
Magic Special Fertilizer .....	8.00	1.65	2.00
Magic Tobacco Grower .....	8.00	1.65	2.00
Magic Peanut Special .....	8.00	.82	4.00
Magic Grain Special .....	8.00	.82	4.00
Magic Peanut Grower .....	8.00	....	4.00
Magic Grain and Grass Grower.....	8.00	....	4.00
Powhatan Bone and Potash Mixture.....	8.00	....	4.00
Powhatan Trucker .....	7.00	4.94	5.00
Copeland's Best Fertilizer .....	7.00	2.88	7.00
Copeland's Special Fertilizer .....	6.00	3.29	7.00
Allen's Special Tobacco Fertilizer.....	6.00	1.65	5.00
Powhatan Top Dresser .....	4.00	8.23	4.00
Magic Top Dresser .....	4.00	6.17	2.50
Sulphate of Ammonia .....	....	19.75	....
Nitrate of Soda .....	....	15.63	....
Tomlinson Nitrate Muriate Special.....	....	9.87	5.00
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
High Grade German Potash.....	....	....	16.00
Pure German Kainit .....	....	....	12.00

*Rasin-Monumental Co., Baltimore, Md.—*

Rasin 16 Per Cent Acid Phosphate.....	16.00	....	....
Rasin Acid Phosphate .....	14.00	....	....
Rasin 13 Per Cent Acid Phosphate.....	13.00	....	....
Rasin H. G. Bone and Potash.....	12.00	....	5.00
Rasin's Big 10 .....	10.00	3.29	4.00
Rasin Seawell Alkaline Phosphate .....	10.00	....	6.00
Rasin Special Bone and Potash.....	10.00	....	5.00
Rasin's Double Bone and Potash.....	10.00	....	4.00
Rasin Bone and Potash .....	10.00	....	2.00
Rasin's Nine-Three-Three Guano .....	9.00	2.47	3.00
Rasin's Dixie Cotton Guano.....	9.00	2.26	2.00
Rasin Dixie Guano .....	9.00	1.65	2.00
Rasin's IXL (Cotton-seed Meal Body).....	9.00	.82	3.00
Baltimore Special Mixture .....	9.00	.82	2.00
Rasin's Dixie H. G. Guano.....	8.00	3.29	4.00
Rasin's Seawall Special Guano .....	8.00	2.47	5.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Rasin's Old Empire Guano Special.....	8.00	2.47	3.00
Rasin's Complete Cotton Compound.....	8.00	2.47	3.00
Rasin's Indian Brand for Tobacco.....	8.00	2.47	3.00
Rasin Gold Standard .....	8.00	2.47	3.00
Rasin Special Fertilizer .....	8.00	2.06	3.00
Rasin's General Tobacco Grower.....	8.00	2.06	3.00
Rasin's Old Empire Guano.....	8.00	1.65	2.00
Rasin's 8-4 Bone and Potash.....	8.00	....	4.00
Rasin Irish Potato Special .....	7.00	3.29	8.00
Rasin Truckers' Mixture .....	6.00	5.77	5.00
Nitrate of Soda .....	....	14.82	....
Muriate of Potash .....	....	....	48.00
Sulphate of Potash .....	....	....	48.00
Rasin Genuine German Kainit.....	....	....	12.00

*Read Phosphate Co., Charleston, S. C.—*

Read's H. G. Dissolved Bone.....	16.00	....	....
Read's H. G. Acid Phosphate .....	14.00	....	....
Read's Bone and Potash .....	10.00	....	4.00
Read's Alkaline Bone .....	10.00	....	2.00
Read's Manipulated Guano .....	9.00	1.65	3.00
Read's H. G. Cotton Guano.....	8.00	4.12	7.00
Read's Ammoniated Dissolved Bone .....	8.00	3.30	6.00
Read's H. G. Guano .....	8.00	3.30	4.00
Read's H. G. Cotton Grower.....	8.00	2.47	3.00
Read's H. G. Tobacco Leaf.....	8.00	2.47	3.00
Read's Soluble Fish Guano .....	8.00	1.65	2.00
Read's Blood and Bone Fertilizer, No. 1....	8.00	1.62	2.00
Read's Special Potash Mixture .....	8.00	....	4.00
Read's Fish and Blood Mixture.....	7.00	3.30	5.00
Nitrate of Soda .....	....	19.00	....
Muriate of Potash .....	....	....	48.00
German Kainit .....	....	....	12.00

*Red Cross Guano Co., Lynchburg, Va.—*

Pure Raw Bone Meal.....Total	22.00	3.71	....
Red Cross Bone Meal.....Total	22.00	3.00	....
Red Cross H. G. Phosphate .....	16.00	....	....
Red Cross Standard Phosphate .....	14.00	....	....
Red Cross Grain Grower .....	10.00	....	4.00
Red Cross Bone and Potash .....	10.00	....	2.00
Red Cross High Grade for Tobacco.....	9.00	2.47	3.00
Red Cross for Tobacco and Truck.....	9.00	1.85	4.00
Red Cross for Bright Tobacco .....	9.00	1.65	2.00
Red Cross Special for Tobacco .....	8.00	2.47	3.00
Red Cross Tobacco Guano .....	8.00	2.06	3.00
Red Cross Crop Grower.....	8.00	1.65	2.00
Red Cross Grain and Grass Special.....	8.00	1.00	3.00

*Rhum Phosphate Mining Co., Mount Pleasant, Pa.—*

Ground Phosphate Rock.....Total	28.00	....	....
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*Richmond Guano Co., Richmond, Va.—*

Pure Animal Bone .....	25.00	2.47	....
Pure Raw Bone Meal.....Total	22.50	3.70	....
Rex Dissolved Bone Phosphate.....	16.00	....	....
High Grade Acid Phosphate.....	14.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Premium Bone and Potash Mixture.....	13.00	....	3.00
Premium Dissolved Bone .....	13.00	....	....
Premium Corn Special .....	12.00	1.00	2.00
Premium Wheat Special .....	12.00	1.00	2.00
H. G. Bone and Potash Mixture.....	12.00	....	5.00
Regal Bone and Potash Mixture.....	12.00	....	4.00
Old Homestead Dissolved Bone.....	12.00	....	....
Dissolved S. C. Phosphate .....	12.00	....	....
Premium Corn Grower .....	10.00	.82	1.00
Bone Mixture .....	10.00	.82	1.00
Premium Crop Grower .....	10.00	.82	1.00
Johnson's Best Bone and Potash.....	10.00	....	5.00
Rex Bone and Potash Mixture.....	10.00	....	4.00
Bone and Potash Mixture.....	10.00	....	2.00
Sanders' Special Formula for Bright Tobacco.	9.00	2.88	5.00
Collins' Special Fertilizer .....	9.00	2.47	2.00
Carolina Cotton Grower .....	9.00	2.26	2.00
Burton Special Tobacco Fertilizer.....	9.00	2.06	3.00
C. & B.'s Best Fertilizer .....	9.00	1.65	3.00
Bumper Crop Ammoniated Guano.....	9.00	1.65	3.00
Lowery's Special Fertilizer .....	9.00	1.65	3.00
Cracker Jack Fertilizer .....	9.00	1.65	2.00
Bone Mixture .....	9.00	1.65	1.00
Tip Top Grain Guano.....	9.00	.82	3.00
Premium Wheat Grower .....	9.00	.82	2.00
Premium Crop Grower .....	9.00	.82	2.00
Southern Trucker .....	8.00	4.11	5.00
Bone and Blood Special for Tobacco.....	8.00	3.29	6.00
Special Fertilizer .....	8.00	3.29	6.00
Perfection Special .....	8.00	3.29	4.00
Beeson's Best Fertilizer .....	8.00	2.47	10.00
Carolina Bright Tobacco Fertilizer.....	8.00	2.47	3.00
Gilt Edge Fertilizer .....	8.00	2.47	3.00
Gilt Edge Tobacco Fertilizer.....	8.00	2.47	3.00
Carolina Bright Special Tobacco Fertilizer...	8.00	2.26	2.50
Tip Top Tobacco Fertilizer.....	8.00	2.06	3.00
Tip Top Fertilizer .....	8.00	2.06	3.00
Carolina Bright for Cotton .....	8.00	2.06	1.50
Special Premium Brand for Tobacco.....	8.00	1.85	2.25
Special Premium Brand for Plants.....	8.00	1.85	2.25
Beeson's Favorite Fertilizer .....	8.00	1.65	10.00
Beeson's Special Fertilizer .....	8.00	1.65	6.00
Rex Tobacco Fertilizer .....	8.00	1.65	4.00
Rex Ammoniated Crop Grower.....	8.00	1.65	3.00
Premium Cotton Fertilizer .....	8.00	1.65	2.00
Premium Tobacco Fertilizer .....	8.00	1.65	2.00
Premium Brand Fertilizer .....	8.00	1.65	2.00
Edgecombe Cotton Grower .....	8.00	1.65	2.00
Premium Grain Special .....	8.00	.82	4.00
Premium Peanut Special .....	8.00	.82	4.00
Premium Peanut Grower .....	8.00	....	4.00
Tip Top Bone and Potash Mixture.....	8.00	....	4.00
Winter Grain and Grass Grower.....	8.00	....	4.00
Clark's Special Formula .....	7.00	4.94	6.00
Special High Grade for Truck.....	7.00	4.94	5.00
10 Per Cent Cabbage Guano.....	6.00	8.23	2.00
Smith's 7 Per Cent Special.....	6.00	5.76	5.00
Edwards' Prolific Cotton Grower .....	6.00	3.29	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Gilt Edge Top Dresser .....	4.00	8.23	4.00
Premium Top Dresser .....	4.00	6.17	2.50
Carter's Special for Tobacco .....	4.00	2.47	6.00
Smith's Special Fertilizer .....	4.00	1.65	7.00
Sulphate of Ammonia .....	....	19.75	....
Nitrate of Soda .....	....	15.63	....
Special Top Dresser .....	....	7.40	3.00
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
High Grade German Potash .....	....	....	16.00
Pure German Kainit .....	....	....	12.00

*Robersonville Guano Co., Robersonville, N. C.—*

Roberson's H. G. Acid Phosphate.....	16.00	....	....
Roberson's 4 Per Cent Special.....	8.00	3.29	....
Roberson's H. G. Tobacco Grower.....	8.00	2.47	3.00
Roberson's H. G. Meal and Fish Guano.....	8.00	2.47	3.00
Roberson's H. G. Cotton Grower.....	8.00	2.47	3.00
Roberson's Special 7-7-7 Potato Grower.....	7.00	5.77	7.00
Roberson's H. G. Truck Guano .....	7.00	4.12	5.00
Roberson's 7 Per Cent Potato Guano.....	6.00	5.77	5.00
Robersonville H. G. Top Dresser.....	4.00	8.23	4.00
Sulphate of Ammonia .....	....	20.50	....
Nitrate of Soda .....	....	15.60	....
Dried Blood .....	....	13.62	....
Fish Scrap .....	....	8.00	....
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
Roberson's Genuine German Kainit.....	....	....	12.00

*Robeson Manufacturing Co., Lumberton, N. C.—*

Eureka .....	10.00	3.30	5.00
Stanby .....	8.00	3.30	4.00
Gold Dollar .....	8.00	3.30	4.00
Globe C. S. M. Guano.....	8.00	2.47	5.00
Bladen Special .....	8.00	2.47	4.00
Silver Dollar .....	8.00	2.47	3.00
Cottonade .....	8.00	2.27	3.00
Robeson's Special .....	8.00	1.65	3.00
Homerun .....	3.00	8.00	5.00

*The Robertson Fertilizer Co., Norfolk, Va.—*

Robertson's Raw Bone Meal .....	21.00	3.71	....
Robertson's Fine Ground Bone.....Total	21.00	2.47	....
High Peak Acid Phosphate.....	16.00	....	....
Scepter Brand Acid Phosphate.....	14.00	....	....
P. M. C. Acid Phosphate.....	13.00	....	....
J. W. S. Special Bone and Potash Mixture...	12.00	....	5.00
J. W. S. Alkaline Bone.....	10.00	....	5.00
Skyscraper Bone and Potash .....	10.00	....	4.00
Level Run Dissolved Bone and Potash.....	10.00	....	2.00
Beaver Brand Soluble Guano.....	9.00	1.85	4.00
Robertson's Blood and Bone Mixture.....	9.00	1.00	2.00
P. M. C. High Grade Soluble Guano.....	8.00	4.12	7.00
Robertson's 5-6-7 Guano .....	8.00	4.12	7.00
Wood's Winner H. G. Guano.....	8.00	3.30	4.00
Robertson's Soluble H. G. Guano.....	8.00	2.47	4.00
Old Kentucky High Grade Tobacco Manure..	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Robertson's Special Formula for Tobacco....	8.00	2.47	3.00
Big Cropper High Grade Guano.....	8.00	2.47	3.00
Robertson's X-(T Ray) Tobacco Grower.....	8.00	2.06	2.00
Yellow Jacket Tobacco Guano .....	8.00	1.85	4.00
Double Dollar Tobacco Guano .....	8.00	1.65	2.00
Double Dollar Soluble Guano .....	8.00	1.65	2.00
Ten Strike Soluble Crop Grower.....	8.00	1.00	4.00
M. C. Special Bone and Potash Mixture.....	8.00	....	4.00
Robertson's 5 Per Cent Guano.....	7.00	4.12	5.00
Robertson's 7 Per Cent for Truck.....	6.00	5.76	5.00
Robertson's 10 Per Cent Truck Guano.....	2.00	8.25	2.00
Nitrate of Soda .....	....	14.85	....
Muriate of Potash .....	....	....	50.00
Genuine German Kaiuit .....	....	....	12.00

*F. S. Royster Guano Co., Norfolk, Va.—*

Pure Raw Bone Meal.....Total	21.50	3.71	....
Arrow Brand Thomas Phosphate.....Total	18.00	....	....
Royster's H. G. 17 Per Cent Acid Phosphate..	17.00	....	....
Royster's H. G. 16 Per Cent Acid Phosphate..	16.00	....	....
Royster's 14 Per Cent Acid Phosphate.....	14.00	....	....
Royster's Dissolved Bone .....	13.00	....	....
Royster's 12 and 5 Bone and Potash Mixture.	12.00	....	5.00
Royster's XX Acid Phosphate .....	12.00	....	....
Royster's 11 and 5 Bone and Potash Mixture.	11.00	....	5.00
Royster's Cotton Special .....	10.00	3.30	4.00
Seminole High Grade Fertilizer .....	10.00	2.47	3.00
Royster's Soluble Guano .....	10.00	1.65	2.00
Haywood County Special Guano .....	10.00	.82	3.00
Royster's 10 and 6 Bone and Potash Mixture.	10.00	....	6.00
Royster's 10 and 5 Bone and Potash Mixture.	10.00	....	5.00
Royster's 10 and 4 Bone and Potash Mixture.	10.00	....	4.00
Royster's Bone and Potash for Grain.....	10.00	....	3.00
Royster's Bone and Potash Mixture.....	10.00	....	2.00
Royster's 4-9-5 Special .....	9.00	3.30	5.00
Tomlinson's Special .....	9.00	2.47	5.00
Royster's 9-3-4 Special .....	9.00	2.47	4.00
Surry Special Tobacco Grower.....	9.00	2.47	3.00
Piedmont Special Cotton Grower .....	9.00	2.47	3.00
Royster's Meal Mixture .....	9.00	2.26	2.00
Royster's Cotton Grower .....	9.00	2.26	2.00
Viking Ammoniated Guano .....	9.00	1.65	3.00
Special Compound .....	9.00	1.65	1.00
Royster's Grain Grower .....	9.00	.82	3.00
Royster's Special 1-9-2 Guano .....	9.00	.82	2.00
Royster's Supreme Tobacco Guano.....	8.00	3.71	7.00
Royster's Best Guano .....	8.00	3.71	7.00
Cobb's High Grade for Tobacco.....	8.00	3.30	5.00
Cobb's H. G. for Cotton.....	8.00	3.30	5.00
Trucker's Delight .....	8.00	3.30	4.00
Jupiter High Grade Guano .....	8.00	3.30	4.00
Royster's H. G. Special Tobacco Guano.....	8.00	3.30	4.00
Milo Tobacco Guano .....	8.00	3.30	4.00
Royster's Special 4-8-3 Guano .....	8.00	3.30	3.00
Gorham's Special .....	8.00	3.30	2.50
Lenoir Special Tobacco Guano .....	8.00	2.88	7.00
Royster's Sovereign Tobacco Grower.....	8.00	2.88	5.00
Eagle's Special Tobacco Guano.....	8.00	2.47	5.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Marlboro High Grade Cotton Grower.....	8.00	2.47	3.00
Ronanza Tobacco Guano .....	8.00	2.47	3.00
Royster's Special Sweet Potato Guano.....	8.00	2.47	3.00
Orinoco Tobacco Guano .....	8.00	2.06	3.00
Special Tobacco Compound .....	8.00	2.06	2.00
Royster's Special Wheat Fertilizer.....	8.00	1.65	2.00
Royster's Complete Guano .....	8.00	1.65	2.00
Farmers' Bone Fertilizer .....	8.00	1.65	2.00
Webb's Korn King .....	8.00	1.65	2.00
Farmers' Bone Fertilizer for Tobacco.....	8.00	1.65	2.00
Jumbo Peanut Grower .....	8.00	1.02	4.00
Royster's 8 and 4 Bone and Potash Mixture..	8.00	....	4.00
Royster's Special 7 Per Cent Truck Guano...	7.00	5.77	7.00
Royster's Early Truck Guano .....	7.00	4.12	8.00
Royal Special Potato Guano.....	7.00	4.12	7.00
Royal Potato Guano .....	7.00	4.12	5.00
Royster's 7 and 5 Bone and Potash Mixture..	7.00	....	5.00
Royster's Peanut Special .....	7.00	....	5.00
Arrow Potato Guano .....	6.00	5.77	5.00
Royster's Irish Potato Guano.....	6.00	4.12	7.00
Yellow Bark Sweet Potato Guano.....	6.00	4.12	7.00
Royster's Special 5-6-5 .....	6.00	4.12	5.00
Pasquotank Potato Guano .....	6.00	3.30	8.00
Royster's Tobacco Manure .....	6.00	3.30	7.00
Oakley's Special Tobacco Guano.....	6.00	3.30	4.00
Royster's 2-6-5 Special .....	6.00	1.65	5.00
Royster's Special 10 Per Cent Truck Guano..	5.00	8.24	3.00
Royster's Cabbage Guano .....	5.00	8.22	2.50
Harvey's Cabbage Guano .....	5.00	6.59	3.00
Royster's Potato Guano .....	5.00	4.94	7.00
Presto Top Dresser .....	4.00	8.22	4.00
Royster's Ground Fish Scrap.....	4.00	8.22	....
Royster's Special Top Dresser .....	4.00	6.18	2.50
Royster's 4-6-4 Special .....	4.00	4.94	4.00
Currituck Sweet Potato Guano .....	4.00	2.47	8.00
Royster's Ground Fish Scrap.....	3.00	8.22	....
Royster's 10-2-5 Top Dresser.....	2.00	8.22	5.00
Nitrate of Soda .....	....	15.22	....
Magic Top Dresser .....	....	7.42	3.00
Cotton-seed Meal .....	....	6.17	....
Sulphate of Potash .....	....	....	48.00
Muriate of Potash .....	....	....	48.00
Manure Salts .....	....	....	20.00
Genuine German Kainit .....	....	....	12.00

*Scotland Neck Guano Co., Scotland Neck, N. C.—*

Our 16 Per Cent Acid Phosphate.....	16.00	....	....
Our Bone and Potash Mixture.....	10.00	....	4.00
Biggs' H. G. Truck Guano.....	8.00	4.12	5.00
Noah Biggs C. S. M. and Fish Scrap Guano..	8.00	3.30	4.00
Noah Biggs' Special Tobacco Guano.....	8.00	2.47	4.00
Johnson's Bright Leaf Tobacco Guano.....	8.00	2.47	3.00
State Farm C. S. M. and Fish Scrap Tobacco Guano .....	8.00	2.47	3.00
Farmers' C. S. M. and Fish Scrap Guano....	8.00	2.06	2.50
Our Special C. S. M. Guano.....	8.00	1.65	2.00
Johnson's Special Potato Guano .....	7.00	5.77	7.00
Our Best Peanut Guano .....	5.50	1.23	5.50

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
K. Elite Top Dressing .....	3.00	7.40	3.50
Nitrate of Soda .....	....	15.50	....
Noah Biggs Top Dresser .....	....	7.46	3.50
Our Genuine German Kainit.....	....	....	12.00

*The Southern Cotton Oil Co., Concord, Davidson,  
Shelby, Gibson, Monroe, and Wadesboro—*

S. C. O. Co.'s 16 Per Cent Acid Phosphate....	16.00	....	....
Gold Seal Acid Phosphate.....	14.00	....	....
Conqueror Bone and Potash.....	10.00	....	4.00
Magnolia Bone and Potash.....	10.00	....	2.00
King Bee .....	9.17	1.65	2.00
Adams' Favorite .....	9.00	2.47	4.50
Uncle Sam .....	9.00	2.47	3.00
Home Made .....	9.00	2.05	3.00
Razem .....	9.00	1.65	3.00
Special Grain Grower .....	9.00	.82	3.00
Special Ash Element .....	8.50	....	3.50
Choice .....	8.00	3.30	6.00
Conqueror .....	8.00	3.30	4.00
Canto .....	8.00	3.29	6.00
Melonite .....	8.00	3.29	4.00
Peacock .....	8.00	2.47	3.00
Moon .....	8.00	2.47	3.00
Landsake .....	8.00	2.47	2.50
Red Bull .....	8.00	2.06	2.00
All-to-Good .....	8.00	2.05	3.00
Gloria .....	8.00	1.65	2.00
Double Two .....	8.00	1.65	2.00
S. C. O. Co.'s Ash Element.....	7.50	....	4.50
Dandy Top Dresser .....	4.00	9.07	2.50
Peerless Top Dresser .....	4.00	6.17	2.50
Nitrate of Soda .....	....	15.00	....
Labi .....	....	8.99	17.00
Special Top Dresser .....	....	8.22	3.00
Muriate of Potash .....	....	....	48.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00

*The Southern Exchange Co., Marton, N. C.—*

S. E. C. Acid Phosphate.....	16.00	....	....
S. E. C. Acid Phosphate.....	14.00	....	....
S. E. C. Bone and Potash Mixture.....	10.00	....	4.00
S. E. C. Bone and Potash Mixture.....	10.00	....	2.00
Juicy Fruit Fertilizer .....	9.00	1.85	4.00
The Walnut Fertilizer .....	8.50	2.06	2.50
Melon Grower .....	8.00	4.11	7.00
McKimmon's Special Truck Formula.....	8.00	4.11	7.00
Two Fours Guano .....	8.00	3.29	4.00
Southern Exchange Co.'s Bright Tobacco Formula .....	8.00	2.47	4.00
That Big Stick Guano .....	8.00	2.47	4.00
Bull of the Woods Fertilizer.....	8.00	2.47	4.00
Marietta Supply Co.'s Best .....	8.00	2.47	3.00
Jack's Best Fertilizer .....	8.00	2.47	3.00
Correct Cotton Compound .....	8.00	2.47	3.00
R. M. C. Special Crop Grower.....	8.00	2.47	3.00
Clark's Special Compound .....	8.00	1.65	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Southern Exchange Co.'s Special Tobacco Fer- tilizer .....	8.00	1.65	3.00
Currie Crop Lifter .....	8.00	1.65	3.00
The Racer Guano .....	8.00	1.65	3.00
The Coon Guano .....	8.00	1.65	2.00
The Southern Exchange Co.'s Top Dresser...	4.00	8.23	2.00
Nitrate of Soda .....	....	15.00	....
Muriate of Potash .....	....	....	49.00
Genuine German Kainit .....	....	....	12.00

*Spartanburg Fertilizer Co., Spartanburg, S. C.—*

16 Per Cent Acid Phosphate.....	16.00	....	....
14 Per Cent Acidulated Phosphate.....	14.00	....	....
Staff of Life .....	13.00	.82	3.00
West's Potash Acid .....	13.00	....	3.00
13-3 Potash Acid .....	13.00	....	3.00
Nitro Blood .....	12.50	1.65	2.50
12-6 .....	12.00	....	6.00
Wheat Formula .....	11.50	1.21	5.00
Gosnell's Plant Food .....	10.50	2.46	2.00
N. C. Special .....	10.50	1.65	8.00
Corn Formula .....	10.50	1.65	5.00
King Tiger .....	10.00	1.65	3.00
10-4 .....	10.00	....	4.00
Dana's Best .....	10.00	....	4.00
Melrose .....	10.00	....	2.00
10-2 .....	10.00	....	2.00
Boll Buster .....	9.20	1.65	2.00
Grain Compound .....	9.20	1.65	2.00
Hummer .....	9.00	1.65	3.00
Tiger Brand .....	9.00	.82	3.00
Unaka .....	8.00	3.29	4.00
Glencoe .....	8.00	2.46	3.00
Corn Grower .....	8.00	1.65	2.00
Corn Maker .....	8.00	1.65	2.00
Corn King .....	8.00	1.65	2.00
C. C. & O. Special .....	8.00	1.65	2.00
Potato Guano .....	7.00	2.46	7.00
Sulphate Ammonia .....	....	20.65	....
Nitrate of Soda .....	....	14.81	....
Muriate of Potash .....	....	....	48.00
Kainit .....	....	....	12.00

*Swift Fertilizer Works, Atlanta, Ga., Wilmington,  
N. C., and Chester, S. C.—*

Swift's Raw Bone Meal .....	Total	23.00	3.70	....
Swift's Pure Bone Meal .....	Total	23.00	2.47	....
Swift's Special .....		16.00	....	....
Swift's Cultivator .....		14.00	....	....
Swift's Harrow .....		13.00	....	....
Swift's North Carolina Special .....		12.00	1.65	2.00
Swift's Special .....		12.00	....	6.00
Swift's Atlanta .....		12.00	....	4.00
Swift's Chattahoochee .....		12.00	....	....
Swift's Farmers' Special .....		10.00	3.29	4.00
Swift's Special High Grade Guano.....		10.00	3.29	3.00
Swift's Corn and Cotton Grower.....		10.00	2.47	3.00
Swift's Eagle .....		10.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Swift's Planters' Special .....	10.00	.82	3.00
Swift's Plow Boy .....	10.00	.82	1.00
Swift's Atlanta .....	10.00	....	5.00
Swift's Farmers' Home .....	10.00	....	4.00
Swift's Field and Farm .....	10.00	....	2.00
Swift's Wheat Grower .....	10.00	....	2.00
Swift's Special .....	9.50	4.12	3.00
Swift's Blood, Bone and Potash.....	9.50	3.29	7.00
Swift's Champion .....	9.00	2.47	4.00
Swift's Special Cotton Grower.....	9.00	2.47	3.00
Swift's Cotton King .....	9.00	2.47	2.00
Swift's Special Cotton Guano .....	9.00	2.26	2.00
Swift's Gold Medal .....	9.00	1.65	3.00
Swift's Farmers' Favorite .....	9.00	1.65	3.00
Swift's Cotton Plant .....	9.00	1.65	1.00
Swift's Special .....	9.00	.82	3.00
Swift's Special Formula .....	9.00	.82	2.00
Swift's Cape Fear .....	8.00	4.12	3.00
Swift's Special Tobacco Grower High Grade.	8.00	3.29	6.00
Swift's Majestic for Tobacco High Grade....	8.00	3.29	4.00
Swift's Monarch .....	8.00	3.29	4.00
Swift's Cotton-seed Meal Compound.....	8.00	3.29	4.00
Swift's Quick Growth Tobacco Fertilizer....	8.00	3.29	2.00
Swift's Strawberry Grower .....	8.00	2.47	10.00
Swift's Piedmont Tobacco Grower .....	8.00	2.47	6.00
Swift's Carter's Prolific .....	8.00	2.47	4.00
Swift's Carolina Tobacco Grower .....	8.00	2.47	3.00
Swift's Ruralist .....	8.00	2.47	3.00
Swift's Cotton-seed Meal Compound.....	8.00	2.47	3.00
Swift's Gold Leaf Tobacco Grower.....	8.00	2.06	3.00
Swift's Braswell Formula .....	8.00	2.06	2.50
Swift's Sumatra Tobacco Grower .....	8.00	2.06	2.00
Swift's Bright Leaf Tobacco Grower.....	8.00	1.65	5.00
Swift's Pioneer Tobacco Grower .....	8.00	1.65	4.00
Swift's Clark's Special Cotton Grower.....	8.00	1.65	3.00
Swift's Red Steer .....	8.00	1.65	2.00
Swift's Golden Harvest .....	8.00	1.65	2.00
Swift's Thompson's Special .....	8.00	.82	5.00
Swift's Special Peanut Grower .....	8.00	.82	4.00
Swift's Golden Grain Grower .....	8.00	.82	4.00
Swift's Golden Grain Grower .....	8.00	.82	4.00
Swift's Plantation .....	8.00	....	4.00
Swift's Carolina 7 Per Cent Special Trucker.	7.00	5.76	7.00
Swift's Special Irish Potato Grower.....	7.00	4.12	8.00
Swift's Potato Grower .....	7.00	4.12	7.00
Swift's Early Trucker .....	7.00	4.12	5.00
Swift's Special High Grade .....	7.00	3.29	5.00
Swift's Special Trucker .....	6.00	5.76	5.00
Swift's Favorite Truck Guano .....	6.00	4.94	6.00
Swift's Special Potato Grower .....	6.00	4.12	7.00
Swift's Special Tobacco Grower .....	6.00	3.29	6.00
Swift's Special 10 Per Cent Blood and Bone Trucker .....	5.00	8.23	3.00
Swift's Superior Top Dresser .....	5.00	8.23	3.00
Swift's Plant Bed Tobacco Fertilizer.....	5.00	6.58	2.00
Swift's Fruiter Top Dresser .....	5.00	4.94	2.50
Swift's Special Top Dresser .....	4.00	8.23	4.00
Swift's Excelsior Top Dresser .....	4.00	6.18	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Swift's Everett's Special Formula .....	4.00	3.29	3.00
Swift's No. 1 Ground Tankage.....	3.50	9.06	....
Swift's Pure Nitrate of Soda .....	....	14.82	....
Swift's Ground Dried Blood .....	....	13.18	....
Swift's Special Top Dresser .....	....	8.23	4.00
Cotton-seed Meal .....	....	7.50	....
Swift's Special Top Dresser .....	....	7.40	4.00
Swift's Nitrogen and Potash, No. 1.....	....	7.40	3.00
Swift's Nitrogen and Potash, No. 2.....	....	6.58	4.00
Swift's Cotton-seed Meal High Grade.....	....	6.18	....
Swift's Muriate of Potash .....	....	....	50.00
Swift's Sulphate of Potash .....	....	....	49.00
Swift's Pure German Kainit .....	....	....	12.00
<i>Tidewater Guano Co., Norfolk, Va.—</i>			
Thomas Phosphate .....	Total 17.00	....	....
B. B. Yellow Tobacco Grower.....	8.00	2.47	3.00
<i>Tuscarora Fertilizer Co., Atlanta, Ga., and Wil- mington, N. C.—</i>			
Tuscarora High Grade Trucker .....	6.00	4.11	7.00
<i>Union Abattoir Co., Norfolk, Va., and New Bern, N. C.—</i>			
Acid Phosphate .....	16.00	....	....
Acid Phosphate .....	14.00	....	....
Red Star Potash and Soluble Bone.....	10.00	....	4.00
Johnson's High Grade .....	9.00	2.06	5.00
Red Star H. G. Guano.....	8.75	2.00	2.00
Cotton Guano .....	8.00	3.28	4.00
Red Star Cotton Guano .....	8.00	2.50	1.00
Cotton and Tobacco Guano.....	8.00	2.46	3.00
Standard Guano .....	8.00	1.65	2.00
Muriate of Potash .....	....	....	50.00
Kainit .....	....	....	12.00
<i>Union Guano Co., Winston-Salem, N. C.—</i>			
Pure Raw Animal Bone Meal.....	20.60	3.71	....
Union 16 Per Cent Acid Phosphate.....	16.00	....	....
Union High Grade Acid Phosphate.....	14.00	....	....
Dissolved Animal Bone Meal.....	13.00	2.06	....
Union Dissolved Bone .....	13.00	....	....
Union 12-6 Bone and Potash.....	12.00	....	6.00
Union 12-5 Bone and Potash.....	12.00	....	5.00
Union 12-4 Bone and Potash.....	12.00	....	4.00
Union 12-3 Bone and Potash.....	12.00	....	3.00
Union 12-2 Bone and Potash.....	12.00	....	2.00
Union 12 Per Cent Acid Phosphate.....	12.00	....	....
Liberty Bell Crop Grower.....	10.50	....	1.50
Union Prolific Cotton Compound .....	10.00	3.29	4.00
Union Special Formula for Cotton.....	10.00	2.47	3.00
Union Mule Brand Guano .....	10.00	1.65	2.00
Grain Chemicals .....	10.00	1.03	6.00
Union 10-6 Bone and Potash.....	10.00	....	6.00
Union 10-5 Bone and Potash.....	10.00	....	5.00
Union 10-4 Bone and Potash.....	10.00	....	4.00
Quakers Grain Mixture .....	10.00	....	4.00
Giant Phosphate and Potash.....	10.00	....	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Finch & Harris's Special Bone and Potash Mixture .....	10.00	....	3.00
Union Bone and Potash.....	10.00	....	2.00
Union Gold Leaf Tobacco Mixture.....	9.00	3.00	6.00
Union Renown Guano .....	9.00	2.47	3.00
Union Complete Cotton Mixture.....	9.00	1.65	3.00
Farmers' Blood and Bone Guano.....	9.00	1.65	3.00
Dixie Cotton Grower .....	9.00	1.65	2.00
Q. and Q. (Quality and Quantity) Guano....	9.00	1.65	1.00
B. S. Ammoniated Guano.....	9.00	.82	3.00
Union Guano for Tobacco .....	8.00	3.29	6.00
Union Premium Guano .....	8.00	3.29	4.00
Bright Leaf Tobacco Compound.....	8.00	2.75	7.00
Union Homestead Guano .....	8.00	2.47	3.00
Victoria High Grade Tobacco Fertilizer.....	8.00	2.47	3.00
Union Water Fowl Guano.....	8.00	2.06	3.00
Union Standard Tobacco Grower .....	8.00	2.06	2.00
Union Potato Mixture .....	8.00	1.65	10.00
Old Honesty Guano .....	8.00	1.65	2.00
Fish Brand Ammoniated Guano for Tobacco.	8.00	1.65	2.00
Old Honesty Tobacco Guano.....	8.00	1.65	2.00
Fish Brand Ammoniated Guano .....	8.00	1.65	2.00
Union Superlative Guano .....	8.00	.82	4.00
Sunrise Ammoniated Guano .....	8.00	.82	3.00
Union S-5 Bone and Potash .....	8.00	....	5.00
Union Wheat Mixture .....	8.00	....	4.00
Union Vegetable Compound .....	7.00	4.12	8.00
Union Truck Guano .....	7.00	3.29	5.00
Complete Mixture for Top Dressing.....	4.00	6.18	4.00
Special 10 Per Cent Top Dresser.....	2.00	8.24	2.50
Nitrate of Soda .....	....	14.82	....
Union Top Dresser Ammonia and Potash Mix- ture .....	....	7.42	3.00
Cotton-seed Meal .....	....	6.18	....
Muriate of Potash .....	....	....	48.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00

*United States Fertilizer Co., Baltimore, Md.—*

Raw Bone Meal .....	Total	22.50	3.69	....
Farm Bell Acid Phosphate .....		16.00	....	....
Farm Bell Acid Phosphate .....		14.00	....	....
Farm Bell Phospho Potassa .....		12.00	....	5.00
Farm Bell Potash and Acid .....		10.00	....	6.00
Farm Bell 10-5 Mixture .....		10.00	....	5.00
Farm Bell Special Mixture .....		10.00	....	4.00
Farm Bell Alkaline Mixture .....		10.00	....	2.00
Farm Bell Big Yield .....		9.00	2.47	4.00
White Oak Mountain Tobacco Guano.....		9.00	2.46	3.00
Farm Bell Harvest Moon.....		9.00	.82	3.00
Farm Bell Buckeye Guano .....		9.00	.82	2.00
Farm Bell Blood, Bone and Potash.....		8.00	4.11	7.00
Farm Bell Excelsior Guano .....		8.00	3.28	7.00
Farm Bell Majestic Guano .....		8.00	3.28	4.00
Farm Bell Tobacco Fertilizer .....		8.00	2.47	4.00
Farm Bell Cotton Special .....		8.00	2.47	3.00
Farm Bell Tobacco Special .....		8.00	2.47	3.00
Farm Bell Crop Grower .....		8.00	2.06	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Farm Bell Tomato Special .....	8.00	2.05	3.00
Farm Bell Tobacco Grower.....	8.00	2.05	3.00
Farm Bell Fruit and Potato Guano.....	8.00	1.65	10.00
Farm Bell Animal Ammoniated .....	8.00	1.65	5.00
Farm Bell Standard Guano .....	8.00	1.65	2.00
Farm Bell Standard for Tobacco.....	8.00	1.65	2.00
Farm Bell Wheat, Oat, Corn Special.....	8.00	.82	6.00
Farm Bell Pennant Winner .....	8.00	.82	4.00
Farm Bell Phosphate and Potash .....	8.00	....	5.00
Farm Bell Wheat and Grass Grower.....	8.00	....	4.00
Farm Bell Truckers' Ideal .....	7.00	4.11	8.00
Farm Bell Potato and Tobacco Guano.....	7.00	2.47	10.00
Farm Bell Klimax Kompond .....	7.00	.82	4.00
Farm Bell 7 Per Cent Trucker.....	6.00	5.75	5.00
Farm Bell Truckers' Favorite .....	6.00	3.28	8.00
Farm Bell Lightning Topper .....	4.00	8.20	3.00
Farm Bell Top Dresser .....	4.00	6.58	2.00
Sulphate of Ammonia .....	....	20.50	....
Nitrate of Soda .....	....	15.50	....
Sulphate of Potash .....	....	....	50.00
Muriate of Potash .....	....	....	48.00
Kainit .....	....	....	12.00

*Vance Guano Co., Henderson, N. C.—*

Best Grade Acid Phosphate.....	16.00	....	....
Vance High Grade Acid Phosphate.....	14.00	....	....
Vance Corn and Grain Grower.....	10.00	1.00	3.50
Farmers' Union .....	9.00	3.00	3.00
Brodie's Best .....	8.00	4.00	4.00
Fish Brand Tobacco Manure.....	8.00	3.00	3.00
Sterling Cotton Grower .....	8.00	2.00	2.00
Hot Stuff .....	8.00	2.00	2.00
Vance Top Dresser .....	3.00	10.00	5.00

*Venable Fertilizer Co., Richmond, Va.—*

Pure Animal Bone .....	Total	25.00	2.47	....
Pure Raw Bone Meal.....	Total	22.50	3.70	....
Venable Best Acid Phosphate.....		16.00	....	....
H. G. Acid Phosphate .....		14.00	....	....
Venable's Dissolved Bone .....		13.00	....	....
Venable's Majestic Bone and Potash Mixture.		12.00	....	5.00
Venable's Standard Acid Phosphate .....		12.00	....	....
Venable's Corn, Wheat and Grass Fertilizer.		10.00	.82	1.00
High Grade Bone and Potash Mixture.....		10.00	....	4.00
Bone and Potash Mixture.....		10.00	....	2.00
Venable Carolina Favorite .....		9.00	2.47	6.00
Venable's 3-9-3 Tobacco Fertilizer .....		9.00	2.47	3.00
Roanoke Mixture .....		9.00	2.26	2.00
Roanoke Meal Mixture .....		9.00	2.26	2.00
Venable's Majestic Guano .....		9.00	1.65	3.00
Venable's B. B. P. Manure.....		9.00	1.65	1.00
Majestic Grain Guano .....		9.00	.82	3.00
Venable's Wheat Grower .....		9.00	.82	2.00
Venable's 5 Per Cent Trucker .....		8.00	4.11	5.00
Venable's Special Tobacco Fertilizer.....		8.00	3.29	6.00
Venable's Sovereign Guano .....		8.00	3.29	4.00
Venable's 4 Per Cent Trucker.....		8.00	3.29	4.00
Venable's H. G. Tobacco Fertilizer.....		8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Farmers' Union H. G. Tobacco Guano.....	8.00	2.47	3.00
Venable's Choice Fertilizer .....	8.00	2.47	3.00
Venable's H. G. Cotton Guano.....	8.00	2.47	3.00
Venable's Alliance Tobacco Manure, No. 1...	8.00	2.06	3.00
Venable's Cotton Grower .....	8.00	2.06	3.00
Venable's Roanoke Special .....	8.00	2.06	3.00
Venable's Ideal Manure .....	8.00	1.65	5.00
Our Union Tobacco Fertilizer.....	8.00	1.65	4.00
Farmers' Union Special Tobacco Fertilizer...	8.00	1.65	2.00
Venable's Meal Mixture .....	8.00	1.65	2.00
Venable's Alliance Tobacco Manure, No. 2...	8.00	1.65	2.00
Our Union Special Fertilizer.....	8.00	1.65	2.00
Planter's Bone Fertilizer .....	8.00	1.65	2.00
Venable's Peanut Special .....	8.00	.82	4.00
Venable's Grain Special .....	8.00	.82	4.00
Venable's Alliance Bone and Potash Mixture.	8.00	....	4.00
Venable's Peanut Grower .....	8.00	....	4.00
Venable's 10 Per Cent Trucker.....	6.00	8.23	2.00
Venable's 6-6-6 Manure .....	6.00	4.94	6.00
Venable's Top Dresser .....	4.00	8.23	4.00
Majestic Top Dresser .....	4.00	6.17	2.50
Sulphate of Ammonia .....	....	19.75	....
Nitrate of Soda .....	....	15.63	....
Special Top Dresser .....	....	7.40	3.00
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
High Grade German Potash.....	....	....	16.00
Pure German Kainit .....	....	....	12.00

*Virginia-Carolina Chemical Co., Richmond, Va.—*

V.-C. C. Co.'s Floats .....	Total	27.00	....	....
V.-C. C. Co.'s Concentrated Acid Phosphate..		24.00	....	....
V.-C. C. Co.'s Pure Raw Bone .....	Total	20.60	3.71	....
V.-C. C. Co.'s Johnson's Best .....		20.00	4.94	6.00
V.-C. C. Co.'s Concentrated Bone and Potash.		20.00	....	4.00
V.-C. C. Co.'s 17 Per Cent Acid Phosphate..		17.00	....	....
V.-C. C. Co.'s Star Brand Ground Slag.....		17.00	....	....
V.-C. C. Co.'s Concentrated Ammoniated ....		16.00	3.29	4.00
V.-C. C. Co.'s Climax Potash Mixture .....		16.00	....	2.00
V.-C. C. Co.'s Alliance Acid Phosphate.....		16.00	....	....
V.-C. C. Co.'s 16 Per Cent Acid Phosphate...		16.00	....	....
V.-C. C. Co.'s Sludge Acid Phosphate .....		14.00	....	....
V.-C. C. Co.'s 14 Per Cent Acid Phosphate...		14.00	....	....
V.-C. C. Co.'s Dissolved Animal Bone..Total		13.00	2.06	....
V.-C. C. Co.'s 13 Per Cent Acid Phosphate...		13.00	....	....
V.-C. C. Co.'s Special High Grade Potash Mix- ture .....		12.00	....	6.00
V.-C. C. Co.'s H. G. Potash Mixture.....		12.00	....	5.00
V.-C. C. Co.'s Goodman's Special Potash Mix- ture .....		12.00	....	5.00
V.-C. C. Co.'s 12-4 Grain Grower .....		12.00	....	4.00
V.-C. C. Co.'s Wythe County Potash Mixture.		12.00	....	3.00
V.-C. C. Co.'s Special Crop Grower .....		12.00	....	3.00
V.-C. C. Co.'s Battle's Crop Grower .....		12.00	....	3.00
V.-C. C. Co.'s 12 Per Cent Acid Phosphate...		12.00	....	....
V.-C. C. Co.'s Home Comfort Acid Phosphate.		12.00	....	....
V.-C. C. Co.'s Virginia 11-5 Bone and Potash.		11.00	....	5.00
V.-C. C. Co.'s Electric H. G. Special.....		10.00	3.29	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
V.-C. C. Co.'s Ideal Crop Grower .....	10.00	2.47	3.00
V.-C. C. Co.'s Special Grain Mixture .....	10.00	1.65	5.00
V.-C. C. Co.'s Sovereign Crop Producer .....	10.00	1.65	2.00
V.-C. C. Co.'s H. G. Southern Fertilizer Companies Scott's Gossypium Phospho.....	10.00	1.05	2.00
V.-C. C. Co.'s Ford's Wheat and Corn Guano.	10.00	.82	2.50
V.-C. C. Co.'s Grain Special .....	10.00	....	6.00
V.-C. C. Co.'s Standard Bone and Potash....	10.00	....	5.00
V.-C. C. Co.'s Crescent Potash Mixture .....	10.00	....	5.00
V.-C. C. Co.'s Special Potash Mixture .....	10.00	....	4.00
V.-C. C. Co.'s Dissolved Bone and Potash....	10.00	....	2.00
V.-C. C. Co.'s Best's H. G. Tobacco Fertilizer.	9.00	2.47	7.00
V.-C. C. Co.'s Great Texas Cotton Grower Soluble Guano .....	9.00	2.47	4.00
V.-C. C. Co.'s 3-9-3 Tobacco Fertilizer .....	9.00	2.47	3.00
V.-C. C. Co.'s Jeffrey's High Grade Guano...	9.00	2.47	3.00
V.-C. C. Co.'s N. and R.'s Best.....	9.00	2.47	3.00
V.-C. C. Co.'s Westfield Special H. G. Tobacco Grower .....	9.00	2.47	3.00
V.-C. C. Co.'s Grey Soil Special H. G. Tobacco Grower .....	9.00	2.47	3.00
V.-C. C. Co.'s Powell's Special H. G. C. S. M.	9.00	2.26	3.00
V.-C. C. Co.'s Southern Cotton Grower C. S. M.	9.00	2.26	2.00
V.-C. C. Co.'s Veeco Cotton Grower C. S. M.	9.00	2.26	2.00
V.-C. C. Co.'s Cotton Grower .....	9.00	2.26	2.00
V.-C. C. Co.'s Best's Special Cotton Grower..	9.00	2.26	2.00
V.-C. C. Co.'s Prolific Cotton Grower C. S. M.	9.00	2.26	2.00
V.-C. C. Co.'s White Stem C. S. M.....	9.00	2.26	2.00
V.-C. C. Co.'s Standard Cotton Grower C. S. M.	9.00	2.26	2.00
V.-C. C. Co.'s Cotton Grower.....	9.00	2.26	2.00
V.-C. C. Co.'s Bumper Crop Grower.....	9.00	2.06	5.00
V.-C. C. Co.'s Cuban Special Mixture.....	9.00	1.85	4.00
V.-C. C. Co.'s Cock's Soluble Guano H. G. Animal Bone .....	9.00	1.85	3.00
V.-C. C. Co.'s No. 923 Guano.....	9.00	1.65	3.00
V.-C. C. Co.'s Reliable Cotton Brand Fertilizer	9.00	1.65	3.00
V.-C. C. Co.'s North State Guano C. S. M....	9.00	1.65	1.00
V.-C. C. Co.'s Grain Mixture.....	9.00	1.03	2.00
V.-C. C. Co.'s Bigelow's Crop Guano.....	9.00	.82	3.00
V.-C. C. Co.'s Burnhardt's Grain and Crop Guano .....	9.00	.82	3.00
V.-C. C. Co.'s McCormick's Wheat and Grain Guano .....	9.00	.82	3.00
V.-C. C. Co.'s Baltimore Special Mixture....	9.00	.82	2.00
V.-C. C. Co.'s Farmer's Friend Favorite Fertilizer Special .....	8.50	1.65	2.00
V.-C. C. Co.'s Powhatan Crop Mixture.....	8.50	1.65	1.50
V.-C. C. Co.'s Pelican Peruvian Guano (Pelican Truck Grower and Top Dresser).....	8.00	4.12	5.00
V.-C. C. Co.'s Muse's Special.....	8.00	3.70	7.00
V.-C. C. Co.'s Enterprise High Grade.....	8.00	3.29	11.00
V.-C. C. Co.'s Long Leaf Tobacco Grower....	8.00	3.29	5.00
V.-C. C. Co.'s Old Dominion Special Mixture for Tobacco .....	8.00	3.29	4.00
V.-C. C. Co.'s Alliance H. G. Manure.....	8.00	3.29	4.00
V.-C. C. Co.'s Fish and Meal Mixture.....	8.00	3.29	4.00
V.-C. C. Co.'s Carr's Crop Grower.....	8.00	3.29	4.00
V.-C. C. Co.'s Farmers' Choice.....	8.00	3.29	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
V.-C. C. Co.'s John F. Croom & Bro. Fish and Meal Mixture .....	8.00	3.29	4.00
V.-C. C. Co.'s Special .....	8.00	3.29	4.00
V.-C. C. Co.'s Nowell & Richardson's Special..	8.00	3.29	4.00
V.-C. C. Co.'s Croom's Crop Grower, Best for All Crops .....	8.00	3.29	4.00
V.-C. C. Co.'s Formula 161 for Tobacco.....	8.00	3.29	4.00
V.-C. C. Co.'s High Grade Tobacco Fertilizer.	8.00	2.47	10.00
V.-C. C. Co.'s Valentine Special.....	8.00	2.47	7.00
V.-C. C. Co.'s Special Mixture.....	8.00	2.47	6.00
V.-C. C. Co.'s Excelsior H. G. Special.....	8.00	2.47	5.00
V.-C. C. Co.'s Lion's High Grade Tobacco Fertilizer .....	8.00	2.47	4.00
V.-C. C. Co.'s Farmers' Success.....	8.00	2.47	4.00
V.-C. C. Co.'s Myatt's Special H. G. Fertilizer.	8.00	2.47	3.00
V.-C. C. Co.'s Alliance Special Fertilizer.....	8.00	2.47	3.00
V.-C. C. Co.'s Croom's Special Cotton Fertilizer, Fish and Meal Mixture.....	8.00	2.47	3.00
V.-C. C. Co.'s Menhaden Fish and Meal Mixture .....	8.00	2.47	3.00
V.-C. C. Co.'s Best's H. G. Cotton and Tobacco Guano .....	8.00	2.47	3.00
V.-C. C. Co.'s Diamond C. S. M.....	8.00	2.47	3.00
V.-C. C. Co.'s Jumbo Peruvian Guano, Jumbo Crop Grower .....	8.00	2.47	3.00
V.-C. C. Co.'s Oldham's Special Compound for Tobacco, High Grade .....	8.00	2.47	3.00
V.-C. C. Co.'s Blake's Best.....	8.00	2.47	3.00
V.-C. C. Co.'s Royal High Grade Fertilizer...	8.00	2.47	3.00
V.-C. C. Co.'s Special High Grade Tobacco Fertilizer C. S. M.....	8.00	2.47	3.00
V.-C. C. Co.'s Adams' Special.....	8.00	2.47	3.00
V.-C. C. Co.'s Peruvian H. G. Tobacco Guano.	8.00	2.47	3.00
V.-C. C. Co.'s Red Cliff H. G. Cotton Grower.	8.00	2.47	3.00
V.-C. C. Co.'s Zeno Special Compound for Tobacco H. G.....	8.00	2.47	3.00
V.-C. C. Co.'s 3-8-3 Tobacco Fertilizer.....	8.00	2.47	3.00
V.-C. C. Co.'s Gold Medal H. G. Tobacco Guano	8.00	2.47	3.00
V.-C. C. Co.'s Blake's H. G. Cotton and Tobacco Guano .....	8.00	2.47	3.00
V.-C. C. Co.'s Atlas Guano C. S. M.....	8.00	2.47	2.50
V.-C. C. Co.'s Admiral C. S. M.....	8.00	2.47	2.50
V.-C. C. Co.'s Good Luck C. S. M.....	8.00	2.47	2.50
V.-C. C. Co.'s Split Silk C. S. M.....	8.00	2.47	2.50
V.-C. C. Co.'s 3 Per Cent Special C. S. M. Guano, No. 3.....	8.00	2.47	2.00
V.-C. C. Co.'s Orange Grove Guano.....	8.00	2.26	2.50
V.-C. C. Co.'s Delta C. S. M. Guano.....	8.00	2.26	2.50
V.-C. C. Co.'s Royal Crown.....	8.00	2.26	2.00
V.-C. C. Co.'s Superlative C. S. M. Guano....	8.00	2.06	3.00
V.-C. C. Co.'s Blue Star C. S. M.....	8.00	2.06	3.00
V.-C. C. Co.'s Potato and Cabbage Special....	8.00	1.65	10.00
V.-C. C. Co.'s Smith's Irish Potato Guano....	8.00	1.65	10.00
V.-C. C. Co.'s Pace's 5 Per Cent Special Potato Guano .....	8.00	1.65	5.00
V.-C. C. Co.'s Bone Favorite .....	8.00	1.65	5.00
V.-C. C. Co.'s Monarch Brand.....	8.00	1.65	5.00
V.-C. C. Co.'s Boon's Favorite.....	8.00	1.65	5.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
V.-C. C. Co.'s Valley Pride.....	8.00	1.65	4.00
V.-C. C. Co.'s Corn and Peanut Special.....	8.00	1.65	4.00
V.-C. C. Co.'s Maultsby's Fish Guano.....	8.00	1.65	3.00
V.-C. C. Co.'s Alliance Grain Fertilizer.....	8.00	1.65	2.00
V.-C. C. Co.'s Winston Special for Cotton....	8.00	1.65	2.00
V.-C. C. Co.'s Diamond Dust C. S. M.....	8.00	1.65	2.00
V.-C. C. Co.'s Plant Food C. S. M.....	8.00	1.65	2.00
V.-C. C. Co.'s Wilson's Standard C. S. M.....	8.00	1.65	2.00
V.-C. C. Co.'s Ajax C. S. M. Guano.....	8.00	1.65	2.00
V.-C. C. Co.'s Farmers' Favorite Fertilizer C. S. M.....	8.00	1.65	2.00
V.-C. C. Co.'s Monarch Wheat and Grass Grower .....	8.00	1.00	7.00
V.-C. C. Co.'s Special Peanut Grower.....	8.00	1.00	4.00
V.-C. C. Co.'s Electric Grain and Grass Grower	8.00	1.00	4.00
V.-C. C. Co.'s Peerless Corn, Wheat and Grass Grower .....	8.00	1.00	4.00
V.-C. C. Co.'s Peanut Grower.....	8.00	.82	4.00
V.-C. C. Co.'s The Harvester.....	8.00	.82	3.00
V.-C. C. Co.'s Pinnacle Grain Grower.....	8.00	.82	3.00
V.-C. C. Co.'s S-5 Potash Mixture.....	8.00	....	5.00
V.-C. C. Co.'s Potash Mixture for Peanuts....	8.00	....	4.00
V.-C. C. Co.'s Jones' Grain Special.....	8.00	....	4.00
V.-C. C. Co.'s Special Wheat Compound.....	8.00	....	4.00
V.-C. C. Co.'s Truck Crop Fertilizer.....	7.00	4.12	7.00
V.-C. C. Co.'s Konqueror H. G. Truck Fertil- izer .....	7.00	4.12	5.00
V.-C. C. Co.'s Pasquotank Trucker.....	7.00	3.29	8.00
V.-C. C. Co.'s Potash Potato Producer.....	7.00	3.29	8.00
V.-C. C. Co.'s Formula 44 for Bright Wrappers and Smokers .....	7.00	2.55	3.20
V.-C. C. Co.'s Plant Bed and High Grade To- bacco Fertilizer .....	7.00	2.26	6.00
V.-C. C. Co.'s Invincible High Grade Fertilizer	6.00	4.12	7.00
V.-C. C. Co.'s Kitty Hawk Truck Fertilizer...	6.00	4.12	7.00
V.-C. C. Co.'s Special Truck Guano.....	6.00	4.12	7.00
V.-C. C. Co.'s Money Maker for Cabbage and Potatoes .....	6.00	1.65	10.00
V.-C. C. Co.'s Clinton Special H. G.....	5.00	2.47	5.00
V.-C. C. Co.'s 10 Per Cent Top Dresser Extra H. G. ....	4.00	8.24	4.00
V.-C. C. Co.'s Fish Scrap.....	4.00	8.24	....
V.-C. C. Co.'s Dewberry Special.....	4.00	6.59	....
V.-C. C. Co.'s Dewberry Special Extra H. G...	4.00	6.56	4.00
V.-C. C. Co.'s High Grade Top Dresser.....	4.00	6.17	2.50
V.-C. C. Co.'s Sulphate of Ammonia.....	....	20.59	....
V.-C. C. Co.'s Nitrate of Soda.....	....	14.82	....
V.-C. C. Co.'s Blood .....	....	13.18	....
V.-C. C. Co.'s Special Top Dresser.....	....	7.41	3.00
V.-C. C. Co.'s Cotton-seed Meal .....	....	6.15	....
V.-C. C. Co.'s Muriate of Potash.....	....	....	48.00
V.-C. C. Co.'s Sulphate of Potash.....	....	....	48.00
V.-C. C. Co.'s Manure Salts.....	....	....	20.00
V.-C. C. Co.'s Kainit.....	....	....	12.00
Allison & Addison's Fulton Acid Phosphate..	14.00	....	....
Allison & Addison's I. X. L. Acid Phosphate..	13.00	....	....
Allison & Addison's Standard Acid Phosphate	12.00	....	....
Allison & Addison's Rockets Acid Phosphate..	12.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Allison & Addison's McGavock's Special Potash Mixture .....	10.00	....	2.00
Allison & Addison's B. P. Potash Mixture....	10.00	....	2.00
Allison & Addison's Star Brand Special Tobacco Manure .....	9.00	2.26	2.00
Allison & Addison's Star Brand Special H. G.	9.00	2.06	5.00
Allison & Addison's Star Brand Guano.....	9.00	1.65	1.00
Allison & Addison's Little Giant Grain and Grass Grower .....	9.00	1.00	2.00
Allison & Addison's Anchor Brand Tobacco Fertilizer .....	8.50	2.26	2.00
Allison & Addison's Star Brand Vegetable Guano .....	8.00	3.75	4.00
Allison & Addison's A. A. Guano.....	8.00	2.47	3.00
Allison & Addison's Anchor Brand Fertilizer.	8.00	1.65	2.00
Allison & Addison's Old Hickory Guano.....	8.00	1.65	2.00
Allison & Addison's Peanut Grower.....	8.00	1.00	4.00
Atlantic and Virginia Fertilizer Co.'s Eureka Acid Phosphate .....	16.00	....	....
Atlantic and Virginia Fertilizer Co.'s Valley of Virginia Phosphate .....	14.00	....	....
Atlantic and Virginia Fertilizer Co.'s Crenshaw Acid Phosphate .....	13.00	....	....
Atlantic and Virginia Fertilizer Co.'s Our Acid Phosphate .....	12.00	....	....
Atlantic and Virginia Fertilizer Co.'s Eureka Bone and Potash Compound.....	10.00	....	2.00
Atlantic and Virginia Fertilizer Co.'s Eureka Ammoniated Bone Special for Tobacco.....	9.00	2.06	2.00
Atlantic and Virginia Fertilizer Co.'s Orient Complete Manure .....	9.00	1.65	2.00
Atlantic and Virginia Fertilizer Co.'s Virginia Truckers .....	8.00	4.12	5.00
Atlantic and Virginia Fertilizer Co.'s Eureka Ammoniated Bone .....	8.00	1.65	2.00
Atlantic and Virginia Fertilizer Co.'s Orient Special for Tobacco .....	8.00	1.65	2.00
Atlantic and Virginia Fertilizer Co.'s Peanut Grower .....	8.00	1.00	4.00
Atlantic and Virginia Fertilizer Co.'s Carolina Trucker .....	7.00	5.76	7.00
Charlotte Oil and Fertilizer Co.'s 15 Per Cent Acid Phosphate .....	15.00	....	....
Charlotte Oil and Fertilizer Co.'s Catawba Acid Phosphate .....	14.00	....	....
Charlotte Oil and Fertilizer Co.'s Acid Phosphate .....	13.00	....	....
Charlotte Oil and Fertilizer Co.'s Dayvault's Special .....	12.00	....	6.00
Charlotte Oil and Fertilizer Co.'s Dissolved Bone .....	12.00	....	....
Charlotte Oil and Fertilizer Co.'s Oliver's Perfect Wheat Grower .....	11.00	2.47	4.00
Charlotte Oil and Fertilizer Co.'s 10-2 Bone and Potash .....	10.00	....	2.00
Charlotte Oil and Fertilizer Co.'s High Grade Special Tobacco Fertilizer .....	9.00	2.06	2.00
Charlotte Oil and Fertilizer Co.'s Queen of the Harvest C. S. M.....	9.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Charlotte Oil and Fertilizer Co.'s McCrary's Diamond Bone and Potash.....	9.00	....	3.00
Charlotte Oil and Fertilizer Co.'s Groom's Spe- cial Tobacco Fertilizer .....	8.00	2.47	4.00
Charlotte Oil and Fertilizer Co.'s Catawba Guano B. G. ....	8.00	2.47	3.00
Charlotte Oil and Fertilizer Co.'s Special 3 Per Cent Guano C. S. M.....	8.00	2.47	2.00
Charlotte Oil and Fertilizer Co.'s Ammoniated Guano B. G. ....	8.00	2.06	1.50
Charlotte Oil and Fertilizer Co.'s Ammoniated Guano C. S. M.....	8.00	2.06	1.50
Charlotte Oil and Fertilizer Co.'s The Leader B. G. ....	8.00	1.65	2.00
Charlotte Oil and Fertilizer Co.'s King Cotton Grower .....	8.00	1.65	2.00
Davie & Whittle's Owl Brand High Grade Acid Phosphate .....	16.00	....	....
Davie & Whittle's Owl Brand High Grade Dissolved Bone .....	14.00	....	....
Davie & Whittle's Owl Brand Acid Phosphate.	15.00	....	....
Davie & Whittle's Owl Brand Dissolved Bone.	12.00	....	....
Davie & Whittle's Owl Brand Acid Phosphate with Potash .....	10.00	....	2.00
Davie & Whittle's Owl Brand High Grade 3 Per Cent Soluble Guano.....	9.00	2.06	3.00
Davie & Whittle's Owl Brand Special Tobacco Guano .....	9.00	2.06	2.00
Davie & Whittle's Owl Brand Truck Guano..	8.00	4.94	5.00
Davie & Whittle's Owl Brand Guano for To- bacco .....	8.00	2.47	3.00
Davie & Whittle's Vinco Guano.....	8.00	1.65	3.00
Davie & Whittle's Owl Brand Guano.....	8.00	1.65	2.00
Davie & Whittle's Peanut Grower.....	8.00	1.00	4.00
Durham Fertilizer Co.'s Best Acid Phosphate.	16.00	....	....
Durham Fertilizer Co.'s Standard High Grade Acid Phosphate .....	14.00	....	....
Durham Fertilizer Co.'s Excelsior Dissolved Bone .....	14.00	....	....
Durham Fertilizer Co.'s Blacksburg Dissolved Bone .....	13.00	....	....
Durham Fertilizer Co.'s N. C. Farmers' Alli- ance Official Acid Phosphate.....	13.00	....	....
Durham Fertilizer Co.'s Double Bone Phos- phate .....	13.00	....	....
Durham Fertilizer Co.'s Acid Phosphate.....	12.00	....	....
Durham Fertilizer Co.'s Great Wheat and Corn Grower .....	10.50	....	1.50
Durham Fertilizer Co.'s Diamond Wheat Mix- ture .....	10.00	....	3.00
Durham Fertilizer Co.'s Standard Wheat and Corn Grower .....	10.00	....	2.00
Durham Fertilizer Co.'s Blue Ridge Wheat Grower .....	10.00	....	2.00
Durham Fertilizer Co.'s Standard Wheat Grower .....	10.00	....	2.00
Durham Fertilizer Co.'s Bone and Potash Mix- ture .....	10.00	....	2.00
Durham Fertilizer Co.'s L. & M. Special.....	9.00	2.47	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Durham Fertilizer Co.'s Standard Guano.....	9.00	1.65	2.00
Durham Fertilizer Co.'s Ammoniated Fertilizer .....	9.00	1.65	1.00
Durham Fertilizer Co.'s Special Plant and Truck Fertilizer .....	8.00	4.12	3.00
Durham Fertilizer Co.'s Durham High Grade.	8.00	3.29	4.00
Durham Fertilizer Co.'s Gold Medal Brand Guano .....	8.00	2.47	3.00
Durham Fertilizer Co.'s Yellow Leaf Tobacco Guano .....	8.00	2.47	3.00
Durham Fertilizer Co.'s N. C. Farmers' Alliance Official .....	8.00	2.06	3.00
Durham Fertilizer Co.'s Pride of Durham Tobacco Grower .....	8.00	2.06	3.00
Durham Fertilizer Co.'s Raw Bone Superphosphate for Tobacco .....	8.00	2.06	2.00
Durham Fertilizer Co.'s Raw Bone Superphosphate .....	8.00	2.06	1.50
Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano .....	8.00	1.65	2.00
Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano for Tobacco .....	8.00	1.65	2.00
Durham Fertilizer Co.'s Blacksburg Soluble Guano .....	8.00	1.65	2.00
Durham Fertilizer Co.'s Progressive Farmer Guano .....	8.00	1.65	2.00
Durham Fertilizer Co.'s Peanut Grower.....	8.00	1.00	4.00
Durham Fertilizer Co.'s Carr's Special Wheat Grower .....	8.00	....	4.00
Durham Fertilizer Co.'s Best Potato Manure.	7.00	5.76	7.00
Lynchburg Guano Co.'s Ironside Acid Phosphate .....	16.00	....	....
Lynchburg Guano Co.'s Lynchburg High Grade Acid Phosphate .....	14.00	....	....
Lynchburg Guano Co.'s Arvonja Acid Phosphate .....	13.00	....	....
Lynchburg Guano Co.'s Spartan Acid Phosphate .....	12.00	....	....
Lynchburg Guano Co.'s Alpine Mixture.....	10.00	....	5.00
Lynchburg Guano Co.'s S. W. Special Bone and Potash Mixture .....	10.00	....	4.00
Lynchburg Guano Co.'s Dissolved Bone and Potash .....	10.00	....	2.00
Lynchburg Guano Co.'s Independent Standard	8.50	1.65	2.00
Lynchburg Guano Co.'s Bright Belt Guano...	8.00	2.47	3.00
Lynchburg Guano Co.'s Solid Gold Tobacco Guano .....	8.00	2.26	4.00
Lynchburg Guano Co.'s New Era.....	8.00	1.65	3.00
Lynchburg Guano Co.'s Lynchburg Soluble...	8.00	1.65	2.00
Lynchburg Guano Co.'s Lynchburg Soluble for Tobacco .....	8.00	1.65	2.00
Norfolk and Carolina Chemical Co.'s Norfolk Reliable Acid Phosphate .....	14.00	....	....
Norfolk and Carolina Chemical Co.'s Norfolk Best Acid Phosphate .....	13.00	....	....
Norfolk and Carolina Chemical Co.'s Norfolk Soluble Bone .....	12.00	....	....
Norfolk and Carolina Chemical Co.'s Norfolk Bone and Potash .....	10.00	....	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Norfolk and Carolina Chemical Co.'s Norfolk Truck and Tomato Grower .....	8.00	4.12	5.00
Norfolk and Carolina Chemical Co.'s Amazon High Grade Manure .....	8.00	2.47	3.00
Norfolk and Carolina Chemical Co.'s Bright Leaf Tobacco Grower .....	8.00	2.47	3.00
Norfolk and Carolina Chemical Co.'s Amazon H. G. Special Tobacco Guano.....	8.00	2.47	3.00
Norfolk and Carolina Chemical Co.'s Cooper's Bright Tobacco Fertilizer .....	8.00	2.06	3.00
Norfolk and Carolina Chemical Co.'s Genuine Slaughter House Bone Guano, Made Ex- pressly for Tobacco .....	8.00	2.06	2.00
Norfolk and Carolina Chemical Co.'s Crescent Brand Ammoniated Fertilizer .....	8.00	1.65	2.00
Norfolk and Carolina Chemical Co.'s Genuine Slaughter House Bone Guano .....	8.00	1.65	2.00
Norfolk and Carolina Chemical Co.'s Peanut Grower .....	8.00	1.00	4.00
Old Dominion Guano Co.'s High Grade Acid Phosphate .....	14.00	....	....
Old Dominion Guano Co.'s Bone Phosphate..	13.00	....	....
Old Dominion Guano Co.'s Royster's Acid Phosphate .....	12.00	....	....
Old Dominion Guano Co.'s Obelisk Brand Bone and Potash .....	10.00	....	4.00
Old Dominion Guano Co.'s Planter's Bone and Potash Mixture .....	10.00	....	3.00
Old Dominion Guano Co.'s Alkaline Bone and Potash .....	10.00	....	2.00
Old Dominion Guano Co.'s Horne's Cotton Fer- tilizer .....	9.00	2.06	3.00
Old Dominion Guano Co.'s Standard Raw Bone Soluble Guano .....	9.00	1.65	1.00
Old Dominion Guano Co.'s Farmers' Friend High Grade Fertilizer .....	8.00	2.47	3.00
Old Dominion Guano Co.'s Farmers' Soluble Bone High Grade Special Tobacco Manure.	8.00	2.47	3.00
Old Dominion Guano Co.'s Farmers' Friend Special Tobacco Fertilizer .....	8.00	2.47	3.00
Old Dominion Guano Co.'s Osceola Tobacco Guano .....	8.00	2.06	3.00
Old Dominion Guano Co.'s Farmers' Friend Fertilizer .....	8.00	1.65	2.00
Old Dominion Guano Co.'s Old Dominion Spe- cial Wheat Guano .....	8.00	1.65	2.00
Old Dominion Guano Co.'s Old Dominion Sol- uble Tobacco Guano .....	8.00	1.65	2.00
Old Dominion Guano Co.'s Bullock's Cotton Guano .....	8.00	1.65	2.00
Old Dominion Guano Co.'s Soluble Guano....	8.00	1.65	2.00
Old Dominion Guano Co.'s Peanut Grower...	8.00	1.00	4.00
Old Dominion Guano Co.'s Miller's Special Wheat Mixture .....	8.00	....	4.00
Old Dominion Guano Co.'s 7-7-7 Truck Guano.	7.00	5.76	7.00
Old Dominion Guano Co.'s Potato Manure....	7.00	4.12	8.00
Old Dominion Guano Co.'s 7 Per Cent Truck Fertilizer .....	6.00	5.76	6.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Old Dominion Guano Co.'s 6-7-5 Truck Guano.	6.00	5.76	5.00
Old Dominion Guano Co.'s Special Sweet Potato Guano .....	6.00	1.65	6.00
Old Dominion Guano Co.'s 10 Per Cent Truck Fertilizer .....	5.00	8.24	2.50
Powers, Gibbs & Co.'s Almont High Grade Acid Phosphate .....	14.00	....	....
Powers, Gibbs & Co.'s Fulp's Acid Phosphate.	13.00	....	....
Powers, Gibbs & Co.'s Cotton Brand Acid Phosphate .....	13.00	....	....
Powers, Gibbs & Co.'s Almont Acid Phosphate.	12.00	....	....
Powers, Gibbs & Co.'s Cotton Brand Acid Phosphate .....	12.00	....	....
Powers, Gibbs & Co.'s Almont Acid Phosphate and Potash .....	10.50	....	1.50
Powers, Gibbs & Co.'s Almont Wheat Mixture.	10.00	....	3.00
Powers, Gibbs & Co.'s Dissolved Bone and Potash .....	10.00	....	2.00
Powers, Gibbs & Co.'s Cotton-seed Meal Standard Guano .....	9.00	2.47	2.00
Powers, Gibbs & Co.'s Truck Farmers' Special Ammoniated Guano .....	8.00	3.29	5.00
Powers, Gibbs & Co.'s Cotton Brand Ammoniated Dissolved Bone .....	8.00	3.29	4.00
Powers, Gibbs & Co.'s Old Kentucky High Grade Tobacco Manure .....	8.00	2.47	3.00
Powers, Gibbs & Co.'s Cotton Belt Ammoniated Guano .....	8.00	2.47	2.00
Powers, Gibbs & Co.'s Carolina Golden Belt Ammoniated Guano for Tobacco.....	8.00	2.06	3.00
Powers, Gibbs & Co.'s Powers' Ammoniated Guano .....	8.00	2.06	2.00
Powers, Gibbs & Co.'s Gibbs' Ammoniated Guano .....	8.00	2.06	1.50
Powers, Gibbs & Co.'s Almont Soluble Ammoniated Guano .....	8.00	1.65	2.00
Powers, Gibbs & Co.'s Cotton-seed Meal Soluble Ammoniated Guano .....	8.00	1.65	2.00
Powers, Gibbs & Co.'s Eagle Island Ammoniated Guano .....	8.00	1.65	2.00
Powers, Gibbs & Co.'s Peanut Grower.....	8.00	1.00	4.00
Southern Chemical Co.'s Comet 16 Per Cent Acid Phosphate .....	16.00	....	....
Southern Chemical Co.'s Click's 16 Per Cent Acid Phosphate .....	16.00	....	....
Southern Chemical Co.'s Red Cross 14 Per Cent Acid Phosphate .....	14.00	....	....
Southern Chemical Co.'s Victor Acid Phosphate .....	13.00	....	....
Southern Chemical Co.'s Chatham Acid Phosphate .....	13.00	....	....
Southern Chemical Co.'s Reaper Grain Application .....	12.00	....	3.00
Southern Chemical Co.'s Tar Heel Acid Phosphate .....	12.00	....	....
Southern Chemical Co.'s Horseshoe Acid Phosphate .....	12.00	....	....
Southern Chemical Co.'s Solid South.....	10.00	....	6.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Southern Chemical Co.'s Quickstep Bone and Potash .....	11.00	....	5.00
Southern Chemical Co.'s Winner Grain Mixture .....	10.00	....	4.00
Southern Chemical Co.'s Farmers' Pride Bone and Potash .....	10.00	....	3.00
Southern Chemical Co.'s Winston Bone and Potash .....	10.00	....	2.00
Southern Chemical Co.'s Mammoth Corn Grower .....	10.00	....	2.00
Southern Chemical Co.'s Mammoth Wheat and Grass Grower .....	10.00	....	2.00
Southern Chemical Co.'s Sun Brand Guano...	9.00	2.06	5.00
Southern Chemical Co.'s George Washington Plant Bed Fertilizer for Tobacco.....	8.00	2.47	2.50
Southern Chemical Co.'s Pilot Ammoniated Guano Special for Tobacco .....	8.00	2.06	3.00
Southern Chemical Co.'s Electric Tobacco Guano .....	8.00	1.65	2.00
Southern Chemical Co.'s Electric Standard Guano .....	8.00	1.65	2.00
Southern Chemical Co.'s Yadkin Complete Fertilizer .....	8.00	1.65	2.00
Southern Chemical Co.'s Chick's Special Wheat Compound .....	8.00	....	4.00
J. G. Tinsley & Co.'s Powhatan Acid Phosphate .....	14.00	....	....
J. G. Tinsley & Co.'s Dissolved S. C. Bone....	13.00	....	....
J. G. Tinsley & Co.'s Stonewall Brand Acid Phosphate .....	12.00	....	....
J. G. Tinsley & Co.'s Bone and Potash Mixture .....	10.00	....	2.00
J. G. Tinsley & Co.'s Powhatan Tobacco Fertilizer .....	9.00	2.47	3.00
J. G. Tinsley & Co.'s Tobacco Fertilizer.....	8.00	3.29	2.50
J. G. Tinsley & Co.'s Richmond Brand Guano.	8.00	2.47	3.00
J. G. Tinsley & Co.'s Peruvian H. G. Tobacco Guano .....	8.00	2.47	3.00
J. G. Tinsley & Co.'s Killickinick Tobacco Mixture .....	8.00	2.06	3.00
J. G. Tinsley & Co.'s Appomattox Standard Tobacco Grower .....	8.00	1.65	2.00
J. G. Tinsley & Co.'s Lee Brand Guano.....	8.00	1.65	2.00
J. G. Tinsley & Co.'s Stonewall Tobacco Guano .....	8.00	1.65	2.00
J. G. Tinsley & Co.'s Peanut Grower.....	8.00	1.00	4.00
J. G. Tinsley & Co.'s Special Irish Potato Guano .....	6.00	5.76	6.00
J. G. Tinsley & Co.'s 7 Per Cent Ammoniated Guano for Truck .....	6.00	5.76	6.00
J. G. Tinsley & Co.'s Irish Potato Guano....	6.00	4.94	6.00
J. G. Tinsley & Co.'s Strawberry Grower....	6.00	3.29	4.00
J. G. Tinsley & Co.'s Top Dresser.....	5.00	9.06	....
J. G. Tinsley & Co.'s 10 Per Cent Truck Guano	5.00	8.24	2.50
S. W. Travers & Co.'s Champion Acid Phosphate .....	16.00	....	....
S. W. Travers & Co.'s Dissolved Bone Phosphate .....	14.00	....	....
S. W. Travers & Co.'s Standard Dissolved S. C. Bone .....	13.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
S. W. Travers & Co.'s Capital Dissolved Bone.	12.00	....	....
S. W. Travers & Co.'s Capital Bone and Potash Compound .....	10.00	....	2.00
S. W. Travers & Co.'s National Tobacco Fertilizer .....	8.50	1.85	2.25
S. W. Travers & Co.'s Capital Truck Fertilizer .....	8.00	3.29	3.00
S. W. Travers & Co.'s Capital Tobacco Fertilizer .....	8.00	3.29	3.00
S. W. Travers & Co.'s Big Leaf Tobacco Grower .....	8.00	2.47	3.00
S. W. Travers & Co.'s Capital Cotton Fertilizer .....	8.00	2.06	2.00
S. W. Travers & Co.'s National Fertilizer....	8.00	1.65	2.00
S. W. Travers & Co.'s National Special Tobacco Fertilizer .....	8.00	1.65	2.00
S. W. Travers & Co.'s Beef Blood and Bone Fertilizer .....	8.00	1.65	2.00
S. W. Travers & Co.'s Peanut Grower.....	8.00	1.00	4.00
S. W. Travers & Co.'s Special Wheat Compound .....	8.00	....	4.00
S. W. Travers & Co.'s 7 Per Cent Truck Fertilizer .....	6.00	5.76	5.00
Virginia State Fertilizer Co.'s Bull Run Acid Phosphate .....	16.00	....	....
Virginia State Fertilizer Co.'s Gilt Edge Brand Acid Phosphate .....	14.00	....	....
Virginia State Fertilizer Co.'s Clipper Brand Acid Phosphate .....	13.00	....	....
Virginia State Fertilizer Co.'s Lurich Acid Phosphate .....	12.00	....	....
Virginia State Fertilizer Co.'s Alps Brand Acid Phosphate .....	12.00	....	....
Virginia State Fertilizer Co.'s Mountain Top Bone and Potash .....	10.00	....	5.00
Virginia State Fertilizer Co.'s XX Potash Mixture .....	10.00	....	4.00
Virginia State Fertilizer Co.'s Dissolved Bone and Potash .....	10.00	....	2.00
Virginia State Fertilizer Co.'s Number One Soluble Guano .....	9.00	1.65	2.00
Virginia State Fertilizer Co.'s Highland King.	9.00	1.65	1.00
Virginia State Fertilizer Co.'s Gamecock Special for Tobacco .....	8.50	1.65	2.00
Virginia State Fertilizer Co.'s High Grade Tobacco Guano .....	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Bull Dog Soluble Guano .....	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Dunnington's Special Formula for Tobacco .....	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Peerless Special Tobacco Guano .....	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Buffalo Guano.	8.00	2.06	3.00
Virginia State Fertilizer Co.'s Austrian Tobacco Grower .....	8.00	2.06	2.00
Virginia State Fertilizer Co.'s Gilt Edge Special Tobacco Guano .....	8.00	2.06	2.00
Virginia State Fertilizer Co.'s Battle Ax Tobacco Guano .....	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Virginia State Fertilizer Co.'s Virginia State Guano .....	8.00	1.65	2.00
Virginia State Fertilizer Co.'s Gilt Edge Brand Dissolved Bone and Potash .....	8.00	....	4.00
<i>Wilson Chemical Co., Wilson, N. C.—</i>			
16 Per Cent Acid Phosphate.....	16.00	....	....
14 Per Cent Acid Phosphate.....	14.00	....	....
Bone and Potash Mixture No. 3.....	10.00	....	5.00
Bone and Potash Mixture No. 2.....	10.00	....	4.00
Bone and Potash Mixture No. 1.....	10.00	....	2.00
8-4.50-7 for Tobacco .....	8.00	3.70	7.00
Wilson Chemical Co.'s Gold Medal Cotton Grower .....	8.00	3.30	4.00
Wilson Chemical Co.'s Gold Medal Tobacco Grower .....	8.00	3.30	4.00
Planters Formula No. 1.....	8.00	2.47	10.00
Planters Formula No. 2.....	8.00	2.47	7.00
W. C. Co.'s Gilt Edge Tobacco Grower.....	8.00	2.47	5.00
East Carolina Cotton Grower .....	8.00	2.47	3.00
East Carolina Tobacco Grower .....	8.00	2.47	3.00
Cotton States Standard .....	8.00	1.65	2.00
Nitrate of Soda .....	....	14.00	....
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	50.00
H. G. 16 Per Cent Kainit.....	....	....	16.00
Genuine German Kainit .....	....	....	12.00
<i>Winborne Guano Co., Norfolk, Va.—</i>			
High Grade Acid Phosphate .....	16.00	....	....
Standard Acid Phosphate .....	14.00	....	....
Best Bone and Potash .....	11.00	....	4.00
Soluble Bone and Potash .....	10.00	....	2.00
Winborne's Triumph Guano .....	8.00	3.30	4.00
Winborne's King Guano .....	8.00	2.47	3.00
Winborne's Special Tobacco Guano.....	8.00	2.47	3.00
Winborne's Crop Grower .....	8.00	1.65	2.00
Winborne's Excelsior Guano .....	8.00	1.65	2.00
Florodora Eureka Guano .....	8.00	1.65	2.00
Climax Peanut Guano .....	8.00	.82	4.00
Premium Top Dresser .....	6.00	7.40	3.00
Special 5-6-7 Truck Guano .....	6.00	4.10	7.00
Winborne's Tip Top Tobacco Guano.....	6.00	3.30	5.00
Winborne's Sweet Potato Guano .....	6.00	2.47	6.00
Big Crop 7 Per Cent Guano.....	5.00	5.75	5.00
Nitrate of Soda .....	....	15.00	....
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00
<i>T. W. Wood &amp; Sons, Richmond, Va.—</i>			
Wood's Pure Animal Bone Meal.....Total	25.00	2.47	....
Ground Basic Slag .....	17.00	....	....
Standard H. G. Acid Phosphate .....	16.00	....	....
Standard High Grade Acid Phosphate.....	14.00	....	....
Standard Bone and Potash Mixture .....	10.00	....	2.00
Standard Corn Fertilizer .....	9.00	1.23	1.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Standard Wheat Fertilizer .....	9.00	1.23	1.00
Standard High Grade Truck Fertilizer.....	8.00	4.93	6.00
Standard Market Grower Fertilizer .....	8.00	3.29	4.00
Standard Irish Potato Fertilizer .....	8.00	2.47	10.00
Standard Vegetable Fertilizer .....	8.00	2.47	3.00
Standard Potato Fertilizer .....	8.00	1.65	5.00
Standard Grain and Grass Fertilizer.....	8.00	1.65	2.00
Standard Crop Grower Fertilizer .....	8.00	1.03	2.00
Wood's Lawn Enricher .....	6.00	2.47	3.00
Nitrate of Soda .....	....	15.63	....
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
Kainit .....	....	....	12.00

*The J. R. Young Fertilizer Co., Norfolk, Va.—*

J. R. Young's 3-8-3 Guano for Cotton.....	8.00	2.47	3.00
J. R. Young's New Process 2-8-2 Guano for Tobacco .....	8.00	2.47	3.00
J. R. Young's New Process 2-8-2 Guano for Cotton, Corn and Peanuts .....	8.00	1.65	2.00

## LEAF TOBACCO SALES FOR NOVEMBER, 1913.

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Pounds sold for producers, first hand.....	24,954,002
Pounds sold for dealers.....	1,173,148
Pounds resold for warehouses.....	1,324,539
	<hr/>
Total.....	27,451,609

## LEAF TOBACCO SALES FOR DECEMBER, 1913.

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Pounds sold for producers, first hand.....	21,345,788
Pounds sold for dealers.....	1,125,009
Pounds resold for warehouses.....	1,381,259
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Total.....	23,852,056

## LEAF TOBACCO SALES FOR JANUARY, 1914.

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Pounds sold for producers, first hand.....	8,556,946
Pounds sold for dealers.....	566,190
Pounds resold for warehouses.....	710,342
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Total.....	9,833,478





**THE BULLETIN**  
OF THE  
**NORTH CAROLINA**  
**DEPARTMENT OF AGRICULTURE**  
**RALEIGH**

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Whole No. 195

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**Fertilizer Experiments with Cotton on the  
Sandy Loam Soils (Norfolk Sandy  
Loams) of the Coastal Plain**

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R. Y. WINTERS.....	Plant Breeding.
G. M. GARREN.....	Assistant Agronomist in Crops.
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\*Assigned by the Bureau of Soils, United States Department of Agriculture.

†Assigned by the Bureau of Animal Husbandry, United States Department of Agriculture.

‡In cooperation with Bureau of Plant Industry, United States Department of Agriculture.

## LETTER OF TRANSMITTAL

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HON. W. A. GRAHAM,  
*Commissioner of Agriculture.*

SIR:—I submit in manuscript a report covering experiments with cotton on the Edgecombe Test Farm for the years 1903-'09, inclusive, together with a discussion of the results. B. W. Kilgore and C. B. Williams are responsible for the plans and conduct of the work in 1903-'07; B. W. Kilgore and G. M. MacNider, 1907-'09. R. W. Pou and R. W. Scott, Jr., had charge of the culture and handling of the crop and E. L. Worthen and W. C. Etheridge did the main work in putting the results in tabular form. C. B. Williams is responsible for the conclusions and the writing of it.

I recommend the publication of this report as the April BULLETIN.

Very respectfully,

C. B. WILLIAMS,  
*Chief, Division of Agronomy.*

Approved for printing:

W. A. GRAHAM,  
*Commissioner.*



# FERTILIZER EXPERIMENTS WITH COTTON ON THE SANDY LOAM SOILS (NORFOLK SANDY LOAMS) OF THE COASTAL PLAIN

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## Being a Report of Work with Cotton on the Edgecombe Test Farm in 1903-1909, Inclusive

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By B. W. KILGORE, C. B. WILLIAMS, G. M. MACNIDER, AND R. W. SCOTT, JR.

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### GENERAL SUMMARY OF RESULTS OF FERTILIZER TESTS

1. The proper fertilization of cotton pays large profits, larger ones than any other staple crop generally grown in the State. What this fertilization should be on these and similar soils is shown by the results of our experiments as given on the following pages.

2. In the production of cotton on this land with only two constituents used nitrogen combined with potash afforded the largest net returns per acre, while a mixture of nitrogen and phosphoric acid gave the smallest profit. The use of phosphoric acid and potash averaged \$4.06 more profit per acre than phosphoric acid and nitrogen, but it was not so great by \$6.24 per acre as that secured on an average by the use of a mixture carrying nitrogen and potash.

The experiments as a whole show nitrogen to be the dominant or controlling constituent of plant-food for increasing yields and adding the greatest profit per acre in growing cotton on this type of soil.

3. The results show that lime alone has been used on an average at a small profit. In combination with nitrogen, phosphoric acid and potash to make a complete fertilizer it has shown an annual increased profit of \$6.17 per acre above the net returns secured from the use of the complete fertilizer alone.

The results show that for cotton growing on this type of land the use of moderate quantities of lime particularly in connection with a complete fertilizer will prove quite profitable.

4. The amount of nitrogen used in the normal fertilizer (400 pounds per acre), applied in these cotton experiments, was  $2\frac{1}{2}$  per cent, or 10 pounds to the acre. This amount was varied so as to give 5, 10, 20 and 30 pounds of nitrogen per acre. The yields and profits per acre were increased as the applications of nitrogen were made larger. As an average of all the results on the two fields, both increase in the yield due to fertilizer and in profit per acre were almost tripled by the use of 30 pounds of nitrogen with normal amounts of phosphoric acid and potash over what they were where only 5 pounds of nitrogen was used with normal amounts of phosphoric acid and potash. The former application on an average gave a profit of \$26.45 per acre over cost of fertilizer applied. The increase of 25 pounds of nitrogen in the formula

(from  $N\frac{1}{2}PK$  to  $N_3PK$ ) has resulted in returns on an average equivalent to 69 cents for each pound of nitrogen added between 5 and 30 pounds per acre. The use of 30 pounds of nitrogen, with the exception of the two and one-half times normal fertilizer application, was the most profitable one tried. Five pounds of nitrogen would be supplied by 81 pounds of  $7\frac{1}{2}$  per cent cottonseed meal, by 40 pounds of 15 per cent dried blood or by 34 pounds of 18 per cent nitrate of soda.

5. The amount of phosphoric acid in the normal fertilizer (400 pounds per acre) was 7 per cent which is equivalent to 28 pounds per acre. This quantity was varied so as to apply 14, 28, 56 and 84 pounds respectively of phosphoric acid per acre, with normal amounts of nitrogen and potash. These amounts of phosphoric acid would be supplied by 100, 200, 400 and 600 pounds respectively of 14 per cent acid phosphate. The greatest net returns over cost of fertilizer per acre was secured in the study of the most profitable quantity of phosphoric acid to use on cotton, by the use of 28 pounds per acre.

6. The amount of potash in the normal fertilizer (400 pounds per acre) was  $2\frac{1}{2}$  per cent, equivalent to 10 pounds per acre. Varying this amount so as to apply 5, 10, 20 and 30 pounds per acre respectively, the results indicate (with one apparently abnormal exception) that the largest profit over cost of fertilizer from different quantities of potash was obtained from the use of about 20 pounds of potash with normal amounts of nitrogen and phosphoric acid. To supply 20 pounds per acre of potash will require an application of 167 pounds of 12 per cent kainit, 100 pounds of 20 per cent manure salt, or 40 pounds of 50 per cent muriate or sulphate of potash.

7. Varying the amounts of the normal fertilizer applications from 200 to 1,000 pounds per acre gave progressively increased yields and profits as the quantity of fertilizer was made larger, the results being quite uniform on an average in this regard. The averages, after deducting for cost of fertilizer showed the following net profits:

200 pounds of fertilizer per acre gave a profit of	\$ 5.95.
400 pounds of fertilizer per acre gave a profit of	11.45.
600 pounds of fertilizer per acre gave a profit of	23.70.
800 pounds of fertilizer per acre gave a profit of	31.63.
1,000 pounds of fertilizer per acre gave a profit of	34.47.

Putting this in a slightly different way, on an average the first 200 pounds of fertilizer yielded a net profit (after deducting for the cost of fertilizer) of \$2.98 for each 100 pounds of fertilizer; the application of 400 pounds yielded \$2.86 per 100 pounds; 600 pounds yielded \$3.95 per 100 pounds; 800 pounds yielded \$3.95 per 100 pounds; and 1,000 pounds yielded \$3.45 profit per 100 pounds of fertilizer.

8. Comparisons of dried blood and nitrate of soda as sources of nitrogen showed no great advantage one over the other in the production of cotton on this type of soil. In the tests nitrate of soda was applied one-half at planting and one-half about July 1, on one plat; one-half was applied about July 1, the other half of the nitrogen coming from dried blood, which was applied before planting on another plat, and

on a third plat nitrate of soda furnished one-fifth of the nitrogen, the balance coming from dried blood, all being applied before planting. The blood was applied one-half at planting and one-half about July 1, on one plat; one-half at planting, the rest of the nitrogen coming from nitrate of soda which was applied July 1 on another plat, and on a third plat four-fifths of the nitrogen was supplied by blood and one-fifth by nitrate of soda. The most economical method of application and the one which made the highest yield of seed cotton was the one which received half of the nitrogen as dried blood in the row at planting with normal quantities of phosphoric acid and potash and the remaining half of the nitrogen as a side dressing in the form of nitrate of soda about July 1.

9. Where 400 pounds of fertilizer were applied each in the drill before planting, broadcast before planting, and divided into two equal parts, one-half being applied in the drill before planting and the other half as a side dressing about July 1, the results are not uniform, but on an average seem to indicate best returns from applying one-half of the fertilizer in drill at planting and other half alongside the row about July 1.

10. Where only 400 pounds is used to the acre the best and most economical returns will be in the drill or alongside the row rather than to be applied broadcast.

11. Our analyses of the various soils of the State indicate that these results will apply to the sandy and fine sandy (Norfolk) loams of the upper Coastal Plain section of the State.

12. In the production of cotton on these soils, taking the results here reported as a whole, it is recommended that at least 400 pounds of fertilizer be used and as much more as can be afforded up to 1,000 pounds per acre. The fertilizer can be most profitably applied in the drill before planting; one-half at planting and the other half as a side dressing about July 1; one-half of the nitrogen as blood, cottonseed meal, fish scrap or tankage in the row at planting with all the phosphoric acid and potash and the remaining nitrogen as nitrate of soda as a side dressing about July 1; or all of the nitrogen in some of the recognized organic forms of carriers of nitrogen with the phosphoric acid and potash at planting.

On land deficient in humus or where no considerable leguminous crops or residues have recently been plowed into the soil, the fertilizer constituents should be contained in the mixture in about the proportion of 7 per cent phosphoric acid, 7 per cent of nitrogen, and 5 per cent of potash. The nitrogen may be all derived from blood, tankage, cottonseed meal, or similar products, or in part from one or all of these, and in part (up to one-half) from nitrate of soda.

Kainit, manure salt, sulphate or muriate of potash may furnish the potash, and acid phosphate the phosphoric acid.

Four hundred pounds of the above mixture would contain 28 pounds of available phosphoric acid, 28 pounds of nitrogen and 20 pounds of potash, and 1,000 pounds would contain 70 pounds of available phosphoric acid, 70 pounds of nitrogen, and 50 pounds of potash. The required amounts of phosphoric acid in 400 and 1,000 pounds respect-

ively of this mixture would be supplied by 175 pounds and 438 pounds of 16 per cent acid phosphate; the nitrogen by 215 pounds and 538 pounds of 13 per cent (N.) dried blood; and the potash by 100 pounds and 250 pounds of manure salt. Other materials or other grades of these same materials may be used, and it will not be difficult, knowing just what they contain, to use such quantities of them as will be necessary to furnish the quantities of plant food, having in mind that it is the specific number of pounds of phosphoric acid, nitrogen and potash that is desired, rather than a given weight of mixed fertilizer.

13. On a whole the results show that lime used at the rate of 1,000 pounds of slaked lime broadcast every two or four years has proven profitable in cotton growing, when the lime was used in connection with an application of the normal fertilizer.

## I. FERTILIZER EXPERIMENTS WITH COTTON ON THE SANDY LOAM SOILS OF THE COASTAL PLAIN

This is the fourth of a series of Bulletins giving the results of experiments to determine the fertilizer or plant food needs of different soil types of the State. The three previous reports issued as the June, August and September (1910) Bulletins of this Department, gave—

1. Results of Fertilizer and Variety Experiments with Cow Peas on Piedmont Red Clay Loam Soil (June).

2. Results of Fertilizer Experiments with Cotton on Piedmont Red Clay Loam Soil; and Varieties, Culture and Fertilization of Cotton on Piedmont Red Clay Loam, Red Clay and Valley Soils (August).

3. Results of Fertilizer Experiments with Corn on Piedmont Red Clay Loam; and Variety Culture and Fertilization of Corn on Piedmont Red Clay Loam, Red Clay, and Valley Soils (September).

More attention is now being paid to the production of cotton than ever before in the history of the State and fertilizers are used more generally and in larger amounts on this crop than in former years.

### WORK REPORTED.

Cotton is our leading money crop. More commercial fertilizer is used in fertilizing and growing this crop than any other. It responds readily and profitably to proper fertilization. Some ten years ago systematic experiments were begun to determine the fertilizer or plant-food requirements for the most economical production of cotton on our different cotton soils.

On the following pages are recorded the results of seven years' fertilizer and variety tests of cotton on the Edgecombe Test Farm of this Department, extending through the years 1903-1909 inclusive. The work is being continued to collect further data, when cotton is grown as it has been in the work here recorded, as well as in rotations with other staple crops and soil-improving crops.

### LOCATION OF FARM AND CHARACTER OF SOIL.

The Edgecombe Test Farm is located near the center of Edgecombe County, on the main road between Tarboro and Rocky Mount, approximately eight miles from either place. It is two miles south of Kingsboro Station.

The main upland soil of this farm is representative of much of the Coastal Plain Section of the State. It consists of a dark gray sandy to fine sandy loam, eight to twelve inches deep, underlain by a yellow sandy clay subsoil. The surface soil is light in texture, and is commonly very deficient in organic matter. It classifies as Norfolk sandy to fine sandy loam. Like most of the sandy soil of the Coastal Plain, the sand content is mostly silica (quartz sand) which contains no important plant food. The chemical analysis of this type of land shows it to be universally deficient in nitrogen and phosphoric acid, and in

the southeastern part of the State, also in potash. The potash content is much higher in the northern part of the Coastal Plain Section; especially is this true northeast of Albemarle Sound. The soil of the Edgecombe Test Farm is between these two extremes, approaching the low rather than the high potash content. Consequently we could hardly expect the increase from the use of potash to be as great when used on this character of soil in the counties to the north of Edgecombe, but in those to the south its use should be accompanied with larger increases and greater profit. These light sandy soils are also deficient in lime. This deficiency is noticeable in the growing of legume crops. Bacteriological investigations show this soil to be very deficient in beneficial bacterial life.

The following figures which are averages for several samples taken on the Edgecombe Farm show the chemical composition of the soil. They state the pounds of plant food per acre contained in the surface to the depth of six and two-third inches, and in subsoil to the depth of twenty-eight inches.

	<i>Pounds in Surface. 6<math>\frac{2}{3}</math> inches.</i>	<i>Pounds in Subsoil. 28 inches.</i>
Nitrogen (N) .....	984	1,720
Phosphoric Acid (P <sub>2</sub> O <sub>5</sub> ) .....	1,236	2,200
Potash (K <sub>2</sub> O) .....	3,810	13,200
Lime (CaO) .....	3,595	10,216

#### PLATS.

The plats on which the experiments were conducted were embraced in fields A and B. The farm on which all the plats are located has been in cultivation for a good many years. The experiments were started on field A in 1903 and on field B in 1905. The plats in field A were laid off in three parallel series of thirteen plats each with a turn row or driveway between each series. The plats are one-tenth acre in size or 217.8 feet by 20 feet, with an unfertilized space between plats sufficient for one row and a four-foot unfertilized space at the end of rows. Plats 1, 2, and 3 of the second series, and 1, 2, 3, 4, 5, 6, 7, and 8 of the third series of this field are somewhat inferior in fertility naturally to the other plats of the field, due to surface washing.

The plats in field B were laid out in a similar way to those of field A, except that the plats in the third series were of one-twentieth acre size, but in the other two series they were of the same dimensions as those of field A. Another difference was that in field B provision was made for two rows between plats instead of one as in field A and these extra rows were fertilized like the plat nearest to them, but were not harvested and weighed with the plats. Work was started on field B in 1905 and a rotation of cotton and corn with field A was begun. Bur clover was sown on field B at the last cultivation of corn in 1908 and of cotton in 1909, but as the bur clover failed in 1909 the plats were seeded to crimson clover early in November and covered by a Planet, Jr., cultivator, going once to the row.

*Field A.*—The plats were used for fertilizer experiments with cotton in 1903-'04-'06-'08; and fertilizer experiments with corn in 1905-'07-'09. In case of each of the two crops the same plan or system of fertilization was followed. By this is meant that plat 8 in all cases received only nitrogen and potash, plat 9 only phosphoric acid and potash, plat 10 a normal application of potash, nitrogen, and phosphoric acid, and so on, though the quantities actually applied varied with the two crops. The fertilization of the cotton plats was based on a normal application of 400 pounds per acre of a mixture containing 7 per cent available phosphoric acid and  $2\frac{1}{2}$  per cent each of nitrogen and potash. The fertilization for corn was on a basis of 300 pounds per acre of a mixture containing 7 per cent available phosphoric acid, 3 per cent nitrogen, and  $1\frac{1}{2}$  per cent potash.

*Field B.*—These plats were used for fertilizer experiments with corn in 1906 and 1908 and for fertilizer experiments with cotton in 1905-'07-'09.

#### PREPARATION AND CULTIVATION.

The land in all cases was well prepared by breaking with a two-horse turning plow in the winter, usually January and February, to a depth of 8 to 10 inches, and allowed to remain this way until just before planting, when it was cut up thoroughly with a disk harrow. The rows were run off  $3\frac{1}{3}$  feet apart, the fertilizer distributed in the drill and covered to a slight ridge, usually with one furrow of disk or other cultivator. This was done some time prior to planting, so as to give the ground time to settle before planting. Russell's Big Boll was the variety of cotton used in all the experiments. The cotton was planted as soon as the weather would permit in the spring, on the slight ridge made in covering the fertilizer, but which was usually brought to a level, or almost to a level, by the cotton planter. The cotton was well cultivated with weeders, harrows, single and two-horse cultivators, requiring not exceeding two furrows to row, making the cultivation deep at beginning and shallow toward the close of the season, when root development of the plants was well extended into the soil. The cultivation was repeated each ten days to two weeks during the season, the crop being laid by between July 15 and August 1, according to season. The crop was thinned as nearly as possible to one stalk in the hill every 15 inches.

#### FERTILIZATION AND FERTILIZER MATERIALS USED.

As already stated, the fertilizer was applied in the drill just before planting the cotton, the exact quantity of material for each row being weighed out separately so that each row would get its proper amount of the several fertilizer constituents. Acid phosphate was used as the source of phosphoric acid; dried blood as the source of nitrogen, except where there was a comparison of different nitrogen-furnishing materials, or where nitrate of soda was used as a part of the nitrogen; manure salt as the source of potash; and rock or builder's lime for lime. The fertilizer materials were analyzed each year and applications made on the basis of actual analyses, so as to give the exact quantities of nitrogen, phosphoric acid, and potash required for each plat. For the sake of simplicity and convenience in presenting the results of a number of

years' experiments, the fertilizer applications are expressed in terms of acid phosphate, containing 14 per cent available phosphoric acid, dried blood containing 13 per cent nitrogen, nitrate of soda containing 14.8 per cent nitrogen, and manure salt containing 20 per cent potash, which figures represent the average composition of these materials. The fertilizer applications in the fertilizer experiments are on the basis of 400 pounds per acre for the normal plat (N P K) of a mixture containing 7 per cent available phosphoric acid and  $2\frac{1}{2}$  per cent each of nitrogen and of potash. Lime is applied at the rate of 500 pounds of rock, builder's or burnt lime. The fertilizer applications in the tables, in addition to being represented in terms of acid phosphate, dried blood, nitrate of soda, and manure salt, are also expressed in terms of the symbols, N, P, K, and L, which have the following significance:

N equals nitrogen at the rate of 10 pounds per acre, or 77 pounds of 13 per cent dried blood;

P equals phosphoric acid at the rate of 28 pounds per acre, or 200 pounds of 14 per cent acid phosphate;

K equals potash at the rate of 10 pounds per acre, or 50 pounds of 20 per cent manure salt;

L equals lime at the rate of 500 pounds rock or unslaked lime per acre.

There are columns in the tables showing the exact weights in pounds of phosphoric acid, nitrogen, and potash applied to each plat (expressed on acre basis), which will enable any one to use the same amounts of fertilizer constituents in other materials if desired.

The following average prices which fairly represent the cost of the several materials to the farmer for the period under experimentation have been assumed for the materials used:

14 per cent Acid Phosphate.....	\$14.00 per ton.
13 per cent Dried Blood .....	60.00 per ton.
14.8 per cent Nitrate of Soda (18 per cent Ammonia) .....	50.00 per ton.
20 per cent Manure Salt .....	20.00 per ton.
Rock Lime .....	10.00 per ton.

The arrangements of the plats and the scheme of fertilizer application is shown by the following:

Normal fertilizer application, 400 pounds per acre of a mixture containing—

Phosphoric Acid .....	7 per cent.
Nitrogen .....	$2\frac{1}{2}$ per cent.
Potash .....	$2\frac{1}{2}$ per cent.

In this normal application—

N equals 10 pounds nitrogen, equals 77 pounds 13 per cent dried blood;

P equals 28 pounds phosphoric acid, equals 200 pounds 14 per cent acid phosphate;

K equals 10 pounds potash, equals 50 pounds 20 per cent manure salt.

## SIZE OF PLATS, ONE-TENTH ACRE.

(217.8 x 20 feet.)

<i>First Series—</i>		<i>Application.</i>		
8	.....	N	K	
9	.....	P	K	
10	.....	N	P	
11	.....	N	P	K
12	.....	N $\frac{1}{2}$ P	K	
13	.....	O		
14	.....	N <sub>2</sub>	P	K
15	.....	N <sub>3</sub>	P	K
16	.....	N	P $\frac{1}{2}$ K	
17	.....	N	P <sub>2</sub>	K
18	.....	N	P <sub>3</sub>	K

*Second Series—*

1 <sup>2</sup>	.....	N	P	K $\frac{1}{2}$
2 <sup>2</sup>	.....	N	P	K <sub>2</sub>
3 <sup>2</sup>	.....	N	P	K <sub>3</sub>
4 <sup>2</sup>	.....	$\frac{1}{2}$	(NPK)	
5 <sup>2</sup>	.....	O		
6 <sup>2</sup>	.....	1 $\frac{1}{2}$	(NPK)	
7 <sup>2</sup>	.....	2	(NPK)	
8 <sup>2</sup>	.....	3	(NPK)	
9 <sup>2</sup>	.....	N	P	K
10 <sup>2</sup>	.....	N	P	K
11 <sup>2</sup>	.....	N	P	K
12 <sup>2</sup>	.....	N	P	K
13 <sup>2</sup>	.....	O		

*Third Series—*

1 <sup>3</sup>	.....	O		
4 <sup>3</sup>	.....	N	P	K
5 <sup>3</sup>	.....	Lime		
6 <sup>3</sup>	.....	N	P	K L
7 <sup>3</sup>	.....	N	P	K

The above represents the plats in field B. In field A and in "Old Field" they are arranged in a similar way.

## WEATHER CONDITIONS DURING 1900-'09, INCLUSIVE.

Besides soil, seed, fertilization, and cultivation, and time of planting, weather conditions, mainly the rainfall, influence the crop yield. In the table presented herewith will be found the monthly and annual rainfall during the years covered by the experiments, the mean monthly and annual rainfall since 1868, and the same data for the months of May to September, inclusive. During the growing months the rainfall was

below normal in all years except 1909. In the years 1903-'04 and '06 this average was approximately an inch or more per month, but for the other three years, 1905-'07 and '08 the deficiency of rainfall during the growing season was only slight. The year 1905 was the only one in the period which had a total rainfall below normal.

TABLE A.—RAINFALL IN INCHES AT TARBORO.

	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	Means of Observation Since 1868
January.....	4.41	1.85	2.85	3.38	3.21	3.21	3.29	1.01	5.20	2.00	3.89
February.....	5.35	1.92	7.23	6.27	4.24	6.79	4.96	4.84	4.38	3.41	4.15
March.....	2.70	3.02	2.86	5.48	4.09	3.51	5.16	2.85	4.47	1.96	3.92
April.....	3.34	5.45	2.48	4.39	1.17	7.52	.71	4.60	2.03	5.93	3.20
May.....	2.07	5.54	4.83	2.43	2.04	4.40	2.17	3.83	4.31	6.17	4.89
June.....	3.54	1.29	3.08	5.26	2.13	3.60	3.04	5.59	3.27	9.92	4.25
July.....	2.02	8.24	1.12	4.44	4.87	7.83	6.53	5.20	9.36	4.07	6.35
August.....	6.72	11.61	5.86	7.43	5.28	4.56	6.09	6.96	6.74	6.99	6.73
September.....	1.05	8.24	4.16	1.42	2.70	3.00	2.45	3.27	.72	.86	3.47
October.....	1.06	3.51	3.17	4.81	1.91	1.62	2.87	1.33	3.55	1.42	3.59
November.....	3.70	1.23	3.35	.74	4.55	.80	.70	5.08	1.25	1.21	2.55
December.....	3.21	5.11	2.18	2.42	4.48	5.54	3.03	5.05	3.46	2.48	3.75
Annual.....	39.17	57.01	43.17	48.47	40.67	52.60	41.00	49.61	48.74	46.42	50.77
Monthly average from May to September in- clusive.....	3.08	6.96	3.81	4.15	3.40	4.70	4.06	4.97	4.86	5.60	5.14

## RESULTS.

In studying the yields of the two fields it will be well to bear in mind that on fields A and B the rotation consisted of cotton and corn and that bur clover as a cover crop was not put on fields A and B until latter part of July in 1908. Field B was sown in bur clover in fall of 1909, but as this failed crimson clover was seeded uniformly over the plates early in November.

In the future, as during the past four years (1910-1913) the crops will be grown according to the following rotation:

First year .....	Cotton and Crimson Clover.
Second year .....	Peanuts and Bur Clover.
Third year .....	Corn and Cowpeas.

The cotton, peanut, and corn crops will be fertilized according to the general scheme of conducting the fertilizer experiments.

The experiments were planned to cover the culture and fertilization of cotton as a whole, but the results of the several subdivisions or phases of the subject are grouped in short tables to facilitate examination and the drawing of conclusions, after which they will be considered as a whole and general conclusions drawn for the fertilization of the crop on this type of soil.

RESULTS IN FIELD A IN 1903, 1904, 1906, AND 1908.

[illegible]





# EFFECT OF NITROGEN, PHOSPHORIC ACID, POTASH AND LIME ALONE AND IN COMBINATION WITH EACH OTHER ON COTTON YIELDS.

The experiments, the results of which are presented in Table I, were planned to determine the effect on yield of cotton of different fertilizer applications when two of the constituents were applied together, as nitrogen and phosphoric acid (N P), nitrogen and potash (N K), and phosphoric acid and potash (P K), and when all three of the fertilizing constituents were applied to make a complete fertilizer (N P K); also to test the effect of lime (L) when used alone and when used in connection with a complete fertilizer (N P K L). The results are shown in yields of seed cotton per acre for the several years, average yields, average increases over the unfertilized (O) plats which represent the effect of the fertilizer applications, the value of increase, cost of the fertilizer, and value of the average annual increase over cost of fertilizer.

*Nitrogen and Phosphoric Acid, N. P.* (Plats 10<sup>3</sup> and 10.) Nitrogen and phosphoric acid gave increased yields over the unfertilized plats four of the seven years on the two fields, the annual average increase for the three years in field B being 288 pounds; for four years on field A an average loss of 9 pounds, or an average annual increase for seven years in the two fields of 167 pounds, worth \$3.81 over the cost of fertilizer.

*Nitrogen and Potash, N K.* (Plats 8 and 8.) The application of nitrogen and potash combined gave large increased yields for all years except one. The average increase on field B was 630 pounds per acre, and 185 on field A. The average increase for the seven years was greater than that given by any of the other applications except complete fertilizer and lime. The average profit from this application was \$14.11 per acre.

*Phosphoric Acid and Potash, P K.* (Plats 9 and 9.) Phosphoric acid and potash combined gave a large average annual increase for the three years on field B—444 pounds—but for the four years on field A the average increase was only 46 pounds. This gives an average increase on the two fields of 217 pounds, worth \$9.77, which is \$7.87 more than the cost of the fertilizer.

*Phosphoric Acid, Potash and Nitrogen, N P K.* (Plats 10 and 11.) These three materials combined in a complete fertilizer gave average increased yields in both fields. The average annual increase for four years on field A was 163 pounds of seed cotton; and for three years on field B, 593 pounds; or an average increase per acre for the seven years of 348 pounds, worth \$11.45 over the cost of fertilizer.

*Lime, L.* (Plats 6<sup>3</sup> and 5<sup>3</sup>.) For the four years on field A the lime plat showed an average annual loss of 56 pounds of seed cotton, representing a financial loss of \$3.15. On field B however, this material gave an increase each of the three years, averaging 218 pounds more than the unfertilized plat, and the profit was \$9.18. As an average of these two apparently contradictory results lime gave an average increase of 62 pounds, representing a profit of \$2.16.

*Lime with Complete Fertilizer, N P K L.* (Plats 7<sup>3</sup> and 6<sup>3</sup>.) With the exception of the year 1905 on field B, lime in combination with the

three fertilizer constituents gave a larger yield of cotton than did complete fertilizer without lime. The average yield for the seven years from this treatment was 142 pounds greater than for complete fertilizer without lime. The profit, \$17.62, is greater than that from any of the other fertilizer combinations.

Taking the experiments as a whole the average results show that:

The combination of nitrogen and phosphoric acid gave the smallest increase and also the least profit.

That nitrogen and potash gave an average yield of 209 pounds more seed cotton than did the nitrogen and phosphoric acid treatment, with a profit of \$14.11.

Phosphoric acid and potash gave a slightly greater yield than nitrogen and phosphoric acid, but not nearly as great as nitrogen and potash.

Nitrogen, added to phosphoric acid and potash, making a complete fertilizer, increased the yield 131 pounds, and gave an additional profit of \$3.58.

The results from lime alone, while contradictory on the two fields, show a slight average increase and a profit of \$2.16. In addition to complete fertilizer, lime shows an increase of 151 pounds of seed cotton, and its application here was at a profit of \$6.17, and for complete application—N P K L—the profit was \$17.62.

The main increased yields and profits came from the use of nitrogen and potash. On the whole, practically no great beneficial effect was seen from the phosphoric acid application. The application of lime was in general, accompanied with some profit.

TABLE II—RESULTS OF FERTILIZER EXPERIMENTS WITH COTTON; EFFECT OF VARYING QUANTITIES OF NITROGEN ON YIELDS.

RESULTS IN FIELD A IN 1903, 1904, 1906 AND 1908.

Number of Plot	FERTILIZER APPLICATION PER ACRE	YIELD OF SEED COTTON IN POUNDS PER ACRE							Pounds of Nitrogen (N) Per Acre	Pounds of Phosphoric Acid (P <sub>2</sub> O <sub>5</sub> ) Per Acre	Pounds of Potash (K <sub>2</sub> O) Per Acre	Average Annual Yield of Seed Cotton in Pounds Per Acre	Increase in Pounds of Seed Cotton Per Acre	Pounds of Seed Cotton Per Acre Due to Fertilizer	Value of Increase at 4.5 Cents Per Pound	Average Cost of Fertilizer Per Acre	Value of Average Annual Increase Over Cost of Fertilizer
		1903	1904	1905	1906	1907	1908	1909									
11	38.5 lbs. 13% blood	1220	1118		1050		1050		5	28			1110	80	\$3.60	\$3.06	\$0.54
	200 lbs. 14% acid phosphate								P								
	50 lbs. 20% manure salt								K		10						
10	77 lbs. 13% blood	1220	1343		1140		1070		10	28			1193	163	7.34	4.21	3.13
	200 lbs. 14% acid phosphate								P								
	50 lbs. 20% manure salt								K		10						
12	154 lbs. 13% blood	1723	1666		1110		1480		20				1495	465	20.93	6.52	14.41
	200 lbs. 14% acid phosphate								P								
	50 lbs. 20% manure salt								K		10						
13	231 lbs. 13% blood	2120	1990		1410		1660		30				1795	765	34.43	8.83	25.60
	200 lbs. 14% acid phosphate								P								
	50 lbs. 20% manure salt								K		10						
7	Unfertilized	1215	1380		900		625		O				1030				

### RESULTS IN FIELD B IN 1905, 1907 AND 1909.

12	38.5 lbs. 13% blood	5	1440	684	740	955	526	23.67	3.06	20.61
	200 lbs. 14% acid phosphate.	28								
	50 lbs. 20% manure salt.	K	10							
11	77 lbs. 13% blood.	N								
	200 lbs. 14% acid phosphate.	P	28							
	50 lbs. 20% manure salt.	K	10							
13	Unfertilized.	O								
	154 lbs. 13% blood.	2 N	630	357	300	429				
14	200 lbs. 14% acid phosphate.	P								
	50 lbs. 20% manure salt.	K	1558	1085	870	1171	742	33.39	6.52	26.87
	231 lbs. 13% blood.	3 N								
15	200 lbs. 14% acid phosphate.	P	28							
	50 lbs. 20% manure salt.	K	10	1755	770	1237	808	36.36	8.83	27.53

### AVERAGE RESULTS FOR SEVEN YEARS IN FIELDS A AND B.

[illegible]

## EFFECT OF VARYING QUANTITIES OF NITROGEN.

These tests (Table II) were planned to determine the effect on the yield of cotton of varying quantities of nitrogen, leaving the phosphoric acid and potash constant. On one plat the nitrogen was reduced to one-half of the normal quantity, making the application 5 pounds of nitrogen per acre or practically  $1\frac{1}{4}$  per cent in the fertilizer mixture. On two of the plats it was increased by 2 and 3 times the normal quantity (10 pounds per acre), making the application 20 and 30 pounds per acre respectively, or on basis of the fertilizer mixture 5 and  $7\frac{1}{2}$  per cent. The average results for both fields show the largest yield and profit from the fertilizer application containing three times normal or the largest quantity of nitrogen in the several mixtures. The three times normal application which represents a fertilizer analyzing  $7-7\frac{1}{2}-2\frac{1}{2}$  gave an average annual increase of 784 pounds of seed cotton, a profit of \$26.45 over the cost of fertilizer. With the exception of the two and a half times normal application this represents the largest profit.

These results indicate as they do those with corn, that nitrogen is one of the controlling constituents, if not the most important one for crop production on this soil.

TABLE III.—RESULTS OF FERTILIZER EXPERIMENTS WITH COTTON; EFFECT OF VARYING QUANTITIES OF PHOSPHORIC ACID.

RESULTS IN FIELD A IN 1903, 1904, 1906, AND 1908.

Number of Plot	FERTILIZER APPLICATION PER ACRE	YIELD OF SEED COTTON IN POUNDS PER ACRE						Average Annual Yield of Seed Cotton in Pounds Per Acre	Increase in Pounds of Seed Cotton Per Acre Due to Fertilizer	Value of Increase at 4.5 Cents Per Pound	Average Cost of Fertilizer Per Acre	Value of Average Annual Increase Over Cost of Fertilizer					
		1903	1904	1905	1906	1907	1908						1909				
*1 <sup>2</sup>	77 lbs. 13% blood.....	N	10						1020	1045	990	775	958	—57	—\$2.57	\$3.51	—\$6.08
	100 lbs. 14% acid phosphate.....	½P		14													
	50 lbs. 20% manure salt.....	K					10										
7	Unfertilized.....	O						1215	1380		900	625	1030				
	77 lbs. 13% blood.....	N	10														
	200 lbs. 14% acid phosphate.....	P		28				1220	1343		1140	1070	1103	163	7.34	4.21	3.13
10	50 lbs. 20% manure salt.....	K				10											
	77 lbs. 13% blood.....	N	10														
	400 lbs. 14% acid phosphate.....	2 P		56				1070	1079	1180	980		1077	62	2.79	5.61	—2.82
*2 <sup>2</sup>	50 lbs. 20% manure salt.....	K			10												
	77 lbs. 13% blood.....	N	10														
	600 lbs. 14% acid phosphate.....	3 P		84				1170	1178	1200	955		1126	111	5.00	7.01	—2.01
*3 <sup>2</sup>	50 lbs. 20% manure salt.....	K			10												
	Unfertilized.....	O					1268	1158	910	722		1015					

\*These plats are not as productive naturally as the other plats in the series of Field A. Much of the top soil has been washed off, they being located on the highest portion of the field.

TABLE III—CONTINUED.

RESULTS IN FIELD B IN 1905, 1907 AND 1909.

Number of Feet	FERTILIZER APPLICATION PER ACRE	Pounds of Nitrogen (N) Per Acre	Pounds of Phosphoric Acid (P <sub>2</sub> O <sub>5</sub> ) Per Acre	Pounds of Potash (K <sub>2</sub> O) Per Acre	YIELD OF SEED COTTON IN POUNDS PER ACRE							Average Annual Yield of Seed Cotton in Pounds Per Acre	Increase in Pounds of Seed Cotton Due to Fertilizer	Value of Increase at 4.5 Cents Per Pound	Cost of Fertilizer	Value of Average Annual Increase Over Cost of Fertilizer
					1903	1904	1905	1906	1907	1908	1909					
16	77 lbs. 13% blood.....	N 10														
	100 lbs. 14% acid phosphate.....	1/2 P	14				1238		904		680	941	512	\$23.04	\$3.51	\$19.53
	50 lbs. 20% manure salt.....	K	10													
11	77 lbs. 13% blood.....	N 10														
	200 lbs. 14% acid phosphate.....	P	28				1455		861		750	1022	593	26.69	4.21	22.48
	50 lbs. 20% manure salt.....	K	10													
17	77 lbs. 13% blood.....	N 10														
	400 lbs. 14% acid phosphate.....	2 P	56				1378		976		770	1041	612	27.54	5.61	21.93
	50 lbs. 20% manure salt.....	K	10													
18	77 lb. 13% blood.....	N 10														
	600 lbs. 14% acid phosphate.....	3 P	81				1503		973		860	1112	683	30.74	7.01	23.73
	50 lbs. 20% manure salt.....	K	10													
13	Unfertilized.....	O					630		357		300	429				



## EFFECT OF VARYING QUANTITIES OF PHOSPHORIC ACID.

The above experiments (in Table III) were planned to show the effect on the yields of seed cotton of varying quantities of phosphoric acid, the nitrogen and potash remaining the same. On one plat one-half the normal quantity of phosphoric acid was applied, or an amount represented by 100 pounds of 14 per cent acid phosphate and equivalent to  $3\frac{1}{2}$  per cent phosphoric acid in the fertilizer mixture. On two plats were applied two and three times the normal quantities of phosphoric acid, represented by 400 and 600 pounds of 14 per cent acid phosphate respectively, or 56 and 84 pounds of phosphoric acid per acre.

Varying the amounts of phosphoric acid had no very marked effect on the yield of cotton. The application of more than normal—28 pounds per acre—which is equal to an application of 200 pounds of 14 per cent acid phosphate failed to increase the yield, and consequently gave less profit. However, when the amount was reduced to one-half normal both yield and profit were less. It is well to remember in this connection that nitrogen and potash alone (see Table I) gave a larger yield and greater profit than did any of the mixtures containing phosphoric acid. These results certainly indicate that the application of phosphoric acid in the form of acid phosphate is not accompanied with much profit.

TABLE IV--RESULTS OF FERTILIZER EXPERIMENTS WITH COTTON; EFFECT OF VARYING QUANTITIES OF POTASH.

RESULTS IN FIELD A IN 1903, 1904, 1906 AND 1908.

[illegible]

TABLE IV—CONTINUED.  
RESULTS IN FIELD B IN 1905, 1907 AND 1909.

Number of Plot	FERTILIZER APPLICATION PER ACRE	Pounds of Nitrogen (N) Per Acre	Pounds of Phosphoric Acid (P <sub>2</sub> O <sub>5</sub> ) Per Acre	Pounds of Potash (K <sub>2</sub> O) Per Acre	YIELD OF SEED COTTON IN POUNDS PER ACRE							Average Annual Yield of Seed Cotton in Pounds Per Acre	Increase in Pounds of Seed Cotton Per Acre	Value of Increase at 4.5 Cents Per Pound	Average Cost of Fertilizer Per Acre	Value of Average Annual Increase Over Cost of Fertilizer
					1903	1904	1905	1906	1907	1908	1909					
12	77 lbs. 13% blood	N 10	28	5			1608		1470		930	1336	966	43.47	3.96	39.15
	200 lbs. 14% acid phosphate	P														
	25 lbs. 20% manure salt	½ K														
13	Unfertilized	O					630		357		300	429				
	77 lbs. 13% blood	N 10	28	10					861		750	1022	593	26.69	4.21	22.48
	200 lbs. 14% acid phosphate	P					1455									
11	50 lbs. 20% manure salt	K														
22	77 lbs. 13% blood	N 10	28	20			1423		1287		930	1213	843	37.94	4.71	33.23
	200 lbs. 14% acid phosphate	P														
	100 lbs. 20% manure salt	2 K														
32	77 lbs. 13% blood	N 10	28	30			1370		1484		800	1218	848	38.16	5.21	32.95
	200 lbs. 14% acid phosphate	P														
	150 lbs. 20% manure salt	3 K														
52	Unfertilized	O					520		410		180	370				



## EFFECT OF VARYING QUANTITIES OF POTASH.

The experiments reported in Table IV were arranged to show the effect on the yield of seed cotton of varying quantities of potash, the nitrogen and phosphoric acid remaining constant. On one plat only one-half the normal quantity of potash was applied, or  $1\frac{1}{4}$  per cent in the fertilizer mixture, or 5 pounds of potash per acre, while on two other plats two and three times the normal quantities were given, or 20 and 30 pounds of actual potash per acre respectively. On basis of the normal fertilizer mixture this would represent 5 and  $7\frac{1}{2}$  per cent of potash in the mixture.

The yield of cotton on Plat 12, field B, which received one-half normal potash is abnormally high. With this exception, increased amounts of potash gave increased amounts of cotton on this field. However, the increase on field B from the application of three times normal—30 pounds—over twice normal—20 pounds—was not enough to pay for the additional fertilizer. For the four years' average on field A, increased amounts of potash gave increased yields and small increased profits. In general it appears that with cotton increasing amounts of potash can hardly be expected to much more than pay for themselves.



TABLE V—CONTINUED.  
RESULTS IN FIELD B IN 1905, 1907 AND 1909.

Number of Plot	FERTILIZER APPLICATION PER ACRE	YIELD OF SEED COTTON IN POUNDS PER ACRE						Pounds of Nitrogen (N) Per Acre	Pounds of Phosphoric Acid (P <sub>2</sub> O <sub>5</sub> ) Per Acre	Pounds of Potash (K <sub>2</sub> O) Per Acre	Average Annual Yield of Seed Cotton in Pounds Per Acre	Increase in Pounds of Seed Cotton Due to Fertilizer	Value of Increase at 4.5 Cents Per Pound	Average Cost of Fertilizer Per Acre	Value of Average Annual Increase Over Cost of Fertilizer
		1903	1904	1905	1906	1907	1908	1909							
4 <sup>2</sup>	38.5 lbs. 13% blood.....								5						
	100 lbs. 14% acid phosphate.....								14						
	25 lbs. 20% manure salt.....			960		1005		560			842	472	\$21.24	\$2.11	\$19.13
	Unfertilized.....			520		410		180			370				
13	Unfertilized.....														
	77 lbs. 13% blood.....			630		357		300			429				
	200 lbs. 14% acid phosphate.....								28						
	50 lbs. 20% manure salt.....			1455		861		750			1022	593	26.69	4.21	22.48
5 <sup>2</sup>	Unfertilized.....														
	115.5 lbs. 13% blood.....			520		410		180			370				
	300 lbs. 14% acid phosphate.....														
	75 lbs. 20% manure salt.....			1243		1266		785			1098	804	36.18	6.32	29.86
7 <sup>2</sup>	154 lbs. 13% blood.....														
	400 lbs. 14% acid phosphate.....								56						
	100 lbs. 20% manure salt.....			1528		1751		1055			1445	1151	51.80	8.42	43.38
	192.5 lbs. 13% blood.....														
8 <sup>2</sup>	500 lbs. 14% acid phosphate.....								70						
	125 lbs. 20% manure salt.....			1823		1727		1210			1587	1293	58.19	10.53	47.66
	Unfertilized.....														
				410		185		60			218				

TABLE V—CONTINUED.  
AVERAGE RESULTS FOR SEVEN YEARS IN FIELDS A AND B.

	Unfertilized	O	5	14	5	797	\$	\$	\$
8-5 <sup>2</sup>	Unfertilized	O	5						
	38.5 lbs. 13% blood	1½ N							
11-4 <sup>2</sup>	200 lbs. 14% acid phosphate	1½ P				976	179	8.06	2.11
	155 lbs. 20% manure salt	1½ K							
7-13	Unfertilized	O				772			
	77 lbs. 13% blood	N	10						
10-11	200 lbs. 14% acid phosphate	P		28		1120	348	15.66	4.21
	50 lbs. 20% manure salt	K		10					
8-6 <sup>2</sup>	115.5 lbs. 13% blood	1½ N	15			1249	667	30.02	6.32
	300 lbs. 14% acid phosphate	1½ P		42					
	75 lbs. 20% manure salt	1½ K		15					
9-7 <sup>2</sup>	154 lbs. 13% blood	2 N	20			1472	890	40.05	8.42
	400 lbs. 14% acid phosphate	2 P		56					
	100 lbs. 20% manure salt	2 K		20					
10-8 <sup>2</sup>	192.5 lbs. 13% blood	2½ N	25			1582	1000	45.00	10.53
	500 lbs. 14% acid phosphate	2½ P		70					
	125 lbs. 20% manure salt	2½ K		25					
7- (5-13 <sup>2</sup> )	Unfertilized	O				582			

## EFFECT OF VARYING QUANTITIES OF FERTILIZER ON YIELDS.

The experiments in Table V were planned to show the effect of increasing and decreasing the normal (N P K equals 400 pounds of a fertilizer mixture containing 7 per cent phosphoric acid,  $2\frac{1}{2}$  per cent potash and  $2\frac{1}{2}$  per cent nitrogen) fertilizer application on the yields. The applications were at the rate of 200 pounds per acre ( $\frac{1}{2}$  N P K); 400 pounds per acre (N P K); 600 pounds per acre ( $1\frac{1}{2}$  N P K); 800 pounds per acre (2 N P K); and 1,000 pounds per acre ( $2\frac{1}{2}$  N P K); The results on several fields and the averages of the two fields are quite uniform in showing increased yields and increased profits for the several increases in the amounts of fertilizer, the quantity of fertilizer per acre varying from 200 to 1,000 pounds. The largest yields, as well as the greatest profit, were obtained from the 1,000-pound application. It is possible that the limit of the most profitable fertilization for cotton on this soil has not been reached, and that more than 1,000 pounds per acre would give remunerative returns. It should be remembered, too, in this connection, that the composition of this mixture is not especially adapted to this soil, as shown by results in previous tables. A larger per cent of nitrogen would certainly have increased the yields and very probably the net profit.

In addition to larger profits from heavy fertilization of the right kind, the land is in all probability improving in productiveness and value. Results on these plats and fields in after years will be most valuable in throwing light on this most important phase of the proper fertilization for immediate returns and for the permanent improvement of the soil. This latter phase of farm practice is not given the thought and consideration it should receive by most farmers.

TABLE VI—RESULTS OF FERTILIZER EXPERIMENTS WITH COTTON; EFFECT OF DIFFERENT MATERIALS FURNISHING NITROGEN AND TIME OF APPLICATION.

RESULTS IN FIELD A IN 1903, 1904, 1906 AND 1908.

Number of Plot	FERTILIZER APPLICATION PER ACRE	YIELD OF SEED COTTON IN POUNDS PER ACRE							Average Annual Yield of Seed Cotton in Pounds Per Acre	Increase in Pounds of Seed Cotton Per Acre	Value of Cotton Per Acre Due to Fertilizer	Increase at 4.5 Cents Per Pound	Average Cost of Fertilizer Per Acre	Value of Average Annual Increase Over Cost of Fertilizer
		1903	1904	1905	1906	1907	1908	1909						
7 <sup>2</sup>	Unfertilized.....													
	38.5 lbs. 13% blood appld. at pltg. 1½ N													
	33.8 lbs. 14.8% nit. soda appld July 1½ N													
	200 lbs. 14% acid phosphate.....P													
	50 lbs. 20% manure salt.....K													
11 <sup>2</sup>	33.8 lbs. 14.8% nit. sod. appld. at pltg. 1½ N													
	33.8 lbs. 14.8% nit. sod. appld. July 1½ N													
	200 lbs. 14% acid phosphate.....P													
	50 lbs. 20% manure salt.....K													
	33.8 lbs. 14.8% nit. sod. appld. at pltg. 1½ N													
12 <sup>2</sup>	33.8 lbs. 14.8% nit. sod. appld. July 1½ N													
	200 lbs. 14% acid phosphate.....P													
	50 lbs. 20% manure salt.....K													
	38.5 lbs. 13% blood appld. at pltg. 1½ N													
	38.5 lbs. 13% blood appld. July 1½ N													
13 <sup>2</sup>	200 lbs. 14% acid phosphate.....P													
	50 lbs. 20% manure salt.....K													
	Unfertilized.....													
	61.6 lbs. 13% blood appld. at pltg. 4/5 N													
	13.5 lbs. 14.8% nit. sod. appld. at pltg. 1/5 N													
8 <sup>3</sup>	200 lbs. 14% acid phosphate.....P													
	50 lbs. 20% manure salt.....K													
	Unfertilized.....													
	61.6 lbs. 13% blood appld. at pltg. 4/5 N													
	13.5 lbs. 14.8% nit. sod. appld. at pltg. 1/5 N													
*1 <sup>3</sup>	200 lbs. 14% acid phosphate.....P													
	50 lbs. 20% manure salt.....K													
	Unfertilized.....													
	61.6 lbs. 13% blood appld. at pltg. 4/5 N													
	13.5 lbs. 14.8% nit. sod. appld. at pltg. 1/5 N													

\*This plot is not as good naturally as the other plots of the series used in making the comparisons. The top soil has been washed off to a considerable extent, as they are located on the most elevated portion of the field.

TABLE VI—CONTINUED.  
RESULTS IN FIELD B IN 1905, 1907 AND 1909.

Number of Plot	FERTILIZER APPLICATION PER ACRE	Pounds of Nitrogen (N) Per Acre	Pounds of Phosphoric Acid (P <sub>2</sub> O <sub>5</sub> ) Per Acre	Pounds of Potash (K <sub>2</sub> O) Per Acre	YIELD OF SEED COTTON IN POUNDS PER ACRE						Value of Increase at 4.5 Cents Per Pound	Average Cost of Fertilizer Per Acre	Value of Average Annual Increase Over Cost of Fertilizer
					1903	1904	1905	1906	1907	1908	1909		
					Yield of Seed Cotton In Pounds Per Acre	Yield of Seed Cotton Per Acre Due to Fertilizer	Yield of Seed Cotton Per Acre	Yield of Seed Cotton Per Acre	Yield of Seed Cotton Per Acre	Yield of Seed Cotton Per Acre	Yield of Seed Cotton Per Acre		
5 <sup>2</sup>	Unfertilized.....O	5	28	10	410	520	410	180	370	180	370	\$	\$
9 <sup>2</sup>	38.5 lbs. 13% blood appld. at pltg. 1-1/2 N	5	28	10	1261	1473	1261	960	1231	960	1231	3.90	33.27
	33.8 lbs. 14.8% nit. sod. appld. July 1-1/2 N	5	28	10	1261	1473	1261	960	1231	960	1231	3.90	33.27
	200 lbs. 14% acid phosphate.....P	5	28	10	1261	1473	1261	960	1231	960	1231	3.90	33.27
	50 lbs. 20% manure salt.....K	5	28	10	1261	1473	1261	960	1231	960	1231	3.90	33.27
10 <sup>2</sup>	33.8 lbs. 14.8% nit. sod. appld. at pltg. 1-1/2 N	5	28	10	1134	1415	1134	890	1146	890	1146	3.59	34.75
	33.8 lbs. 14.8% nit. sod. appld. July 1-1/2 N	5	28	10	1134	1415	1134	890	1146	890	1146	3.59	34.75
	200 lbs. 14% acid phosphate.....P	5	28	10	1134	1415	1134	890	1146	890	1146	3.59	34.75
	50 lbs. 20% manure salt.....K	5	28	10	1134	1415	1134	890	1146	890	1146	3.59	34.75
11 <sup>2</sup>	38.5 lbs. 13% blood appld. at pltg. 1-1/2 N	5	28	10	804	1325	804	630	940	630	940	4.21	24.86
	38.5 lbs. 13% blood appld. July 1-1/2 N	5	28	10	804	1325	804	630	940	630	940	4.21	24.86
	200 lbs. 14% acid phosphate.....P	5	28	10	804	1325	804	630	940	630	940	4.21	24.86
	50 lbs. 20% manure salt.....K	5	28	10	804	1325	804	630	940	630	940	4.21	24.86
12 <sup>2</sup>	61.6 lbs. 13% blood appld. at pltg. 4/5 N	8	28	10	952	1350	952	680	994	680	994	4.14	27.36
	13.5 lbs. 14.8% nit. sod. appld. at pltg. 1/5 N	2	28	10	952	1350	952	680	994	680	994	4.14	27.36
	200 lbs. 14% acid phosphate.....P	2	28	10	952	1350	952	680	994	680	994	4.14	27.36
	50 lbs. 20% manure salt.....K	2	28	10	952	1350	952	680	994	680	994	4.14	27.36
13 <sup>2</sup>	Unfertilized.....O	5	28	10	185	410	185	60	218	60	218		



## EFFECT OF DIFFERENT MATERIALS FURNISHING NITROGEN AND TIME OF APPLICATION.

The experiments, the results of which are presented in Table VI, were arranged to test the comparative value of dried blood and nitrate of soda as nitrogen-furnishing materials in growing cotton, as well as the best way of applying these.

Nitrate of soda is a material easily soluble in water and therefore quickly available for the use of plants. The questions usually raised in connection with its use are the possibility of its loss from the soil, especially sandy or open, porous soil, because of its easy solubility in water and its giving out before a long-seasoned crop has made its growth, thus leaving it without a supply of nitrogen before the end of the growing season. Its use is most strongly advocated for short-season crops, as in early truck and vegetable growing, and as a top dressing for grain and for corn and cotton after growth is well advanced, or for any crop when seen to be in need of a quickly-acting nitrogen-supplying material.

Dried blood, which is a fair representative of the animal and vegetable materials furnishing nitrogen, as cotton-seed meal, tankage, etc., is not soluble in water and acts more slowly and for a longer time. It must be changed by rotting or decomposing in the soil into nitrates before it can feed the crop, and is thus likely to be effective throughout a reasonable growing season.

It has become a practice in growing many crops to apply only a part of the nitrogen at the time of planting and a portion later, usually as nitrate of soda, so as to keep the crop growing as rapidly as possible. The tests in Table VI were planned with a view of throwing as much light as possible on these questions of nitrogen fertilization. In the experiments all of the phosphoric acid and potash were applied in the drill before planting. On plats 11<sup>2</sup> and 9<sup>2</sup> one-half the nitrogen was supplied as dried blood and was applied with the phosphoric acid and potash before planting, and one-half the nitrogen was supplied as nitrate of soda and applied about July first. In plats 12<sup>2</sup> and 10<sup>2</sup> all of the nitrogen was furnished by nitrate of soda, one-half being applied before planting, with the phosphoric acid and potash and the other half about July first. On plats 13<sup>2</sup> and 11<sup>2</sup> the nitrogen was supplied by dried blood, one-half being applied before planting, with the phosphoric acid and potash and the other half about July first. On plats 13 and 12<sup>2</sup> four-fifths of the nitrogen was furnished by dried blood and one-fifth by nitrate of soda and was all applied before planting, along with the phosphoric acid and potash.

It is evident that there is considerable variation in the different years and on the different fields. In studying these results it is only fair to practically disregard plat 13, field A, for it is naturally much less fertile than the check plat of the same series—8<sup>3</sup>. With this exception the average table shows no marked difference in profit favoring any single method of application. On the average, two applications of nitrogen, one-half at planting and one-half about July 1, gave the largest increase and profit. Considering the results on field B alone, and this probably

is more accurate than the average (on account of the lack of uniformity in field A), two applications of the nitrogen in all cases gave larger profit than the single application either applied in the drill before planting (plat 11) or broadcasted (plat 7<sup>3</sup>). From the data at hand it hardly seems safe to draw any definite conclusions in favor of either method. Taking into consideration the results from similar treatments on the Fredell Test Farm (see August Bulletin, 1910, No. 139), it appears that the dried blood and nitrate of soda are about equally satisfactory sources of nitrogen, the choice between them depending largely on market prices, and that very little extra profit can be expected by making two applications of the nitrogen when the total amount is not over ten pounds per acre. In larger amounts a second application may prove profitable.





EFFECT OF DIFFERENT METHODS AND TIME OF APPLICATION OF  
FERTILIZER.

The results presented in Table VII were obtained from experiments planned to show the effect on yield of seed cotton from applying—

(a) All the fertilizer in the drill before planting;

(b) Dividing the fertilizer into two equal parts, applying one-half in the drill before planting and the other half as a side dressing about July first; and

(c) From applying all of the fertilizer broadcast before planting, the quantity of fertilizer and the materials entering into it being the same in all three cases.

Taking the results as a whole, the increased yields and profits show that it has made very little difference whether all of the fertilizer was applied in the drill before planting, or whether it was divided into two equal parts and one-half put in the drill before planting and the other half applied as a side dressing about July first, according to season. The double application gave the largest yield and profit, the drill application before planting slightly less, and the broadcast application a still smaller yield and profit. These differences are hardly sufficient to warrant any definite conclusions in favor of one method above another.

## II. VARIETIES, CULTURE AND FERTILIZATION OF COTTON ON SANDY LOAM SOILS OF THE COASTAL PLAIN

Seven years' fertilizer and variety experiments have been conducted on the sandy loam soil of the Edgecombe Test Farm. On a basis of these results and other information which we have, the suggestions below are given for the culture and fertilization of cotton on the sandy and sandy loam soils of the Coastal Plain section, and the varieties of cotton which are best suited to them.

Cotton is not a hard or exhaustive crop on the soil, when the soil and crop are handled with care and intelligence. A bale of cotton (900 pounds of seed and 500 pounds of lint) removes from the soil in round numbers:

30 pounds Nitrogen,  
12 pounds Phosphoric Acid, and  
13 pound Potash,

worth at present prices of fertilizer ingredients \$7.20. Only 48 cents worth of this is carried away in the lint. The seed can be sold for enough to return in commercial fertilizer considerably more plant food than the lint and seed took from the soil. The stalks, leaves, and bolls, which should never be burned or otherwise removed, and 95 per cent of which have come from the air, add vegetable matter or humus to the soil. If the land is liberally fertilized in the right way, well drained and protected from surface washing, it should continue to produce large and profitable crops of cotton from year to year, and with a good rotation and profitable fertilization will increase in fertility and productiveness. None of our other staple crops are as easy on the soil as is cotton when handled in the way indicated above.

*Preparation and Cultivation.*—The land should be thoroughly and well prepared by breaking in the fall or early spring to a depth of 6 or 8 inches, and the soil may be gradually deepened beyond this for a few inches to advantage. Before planting, cut up well with a disk harrow to get rid of clods and to make a good seedbed, and run off rows  $3\frac{1}{2}$  to 4 feet apart, and on very fertile land  $4\frac{1}{2}$  feet. As a rule, the fertilizer should be put in the drill before planting and the cotton planted on a level or just above the level, according to the season and drainage condition of the land. Weeders and light harrows may be run across the rows two or three times before and after the cotton is up and before cultivation with cultivators and hoeing begins. When the crop is well up and danger of frost is over, hoe and thin to a stand of 15 to 20 inches in the drill, leaving as nearly as possible one stalk in a place, and giving greater distance in the row and between rows as the productiveness of the land increases. On thin land the rows should be closer together and the cotton closer in rows, as the stalks do not grow very large; but distance should be given both ways as the land increases in productive-

ness, from whatever cause brought about. Cultivate with good one or two-horse cultivators, which will not require more than two furrows at greatest to the row, every ten days to two weeks and as nearly as possible after rains to keep down grass and weeds and to conserve the supply of moisture. The cultivation should be comparatively deep early in the season, becoming shallow as the crop grows and the root system develops. Ordinarily cultivation should be continued in the Coastal Plain section of the State until July 15, or later.

*Varieties.*—Up through 1909 sixty-seven varieties of cotton have been tested on the Edgecombe Farm, a number of these running through the entire period. Generally the later maturing varieties of the big boll type have given the largest returns, though now and then, with a short growing season, the small boll, early maturing kinds have stood well. Among the varieties which have done well are:

*Medium to Large Bolled Varieties—*

Russell's Big Boll.  
Culpepper's Improved.  
Cleveland's Big Boll.  
Cook's Improved.  
Brown's No. 1.  
Peterkin's Improved.

*Small Bolled Varieties—*

King's Improved.  
Hodge.  
Webb.  
Broadwell's Double-Jointed.  
Sugar Loaf.

The results of variety tests have been published each year and are summarized in the *February* (1909) *Bulletin*. These results can be had for study by any one specially interested in them.

*Fertilization.*—Analyses of these soils show that they are very low in nitrogen and phosphoric acid and only fairly well supplied with potash and lime. Experiments show that nitrogen is the most needed constituent for the production of cotton, but that profitable results are secured from the use of materials carrying potash and phosphoric acid. The aim of the farmers on the Coastal Plain soils of the State should be to supply as great amount as possible of the nitrogen requirements of his soil by establishing rotations in which leguminous crops come into the rotation at as frequent intervals as practicable. As many of these crops or crop residues should be plowed into the soil as possible to provide as nearly as possible the requisite amount of nitrogen for other crops in the rotation, and also to store the soil with plenty of organic matter in order to maintain the soil in a good physical condition. Where commercial fertilizers are depended upon largely to supply the nitrogen and other plant food constituents, it is not possible, with the present results, to say just definitely what is the best proportion of these three constitu-

ents for most profitable returns, but it is certain that the fertilizer should carry a much higher percentage of nitrogen than has been used heretofore, if the soil is not well stocked with organic matter, and that the phosphoric acid may be decreased. The indications are that for the average soil of the Coastal Plain a mixture containing about 7 per cent of available phosphoric acid, 7 per cent of nitrogen and 5 per cent of potash will give close to if not the best results. This mixture should be used for best results at the rate of at least 400 pounds per acre, and as much more as one can afford up to 1,000 pounds.

The nitrogen may be all derived from blood, tankage, cotton-seed meal, or similar products, or in part from one or all of these, and in part (up to one-half) from nitrate of soda or sulphate of ammonia.

Kainit, manure salt, sulphate or muriate of potash may furnish the potash, and acid phosphate the phosphoric acid. Four hundred pounds of the above mixture would contain 28 pounds phosphoric acid, 28 pounds of nitrogen and 20 pounds of potash, and 1,000 pounds would contain 70 pounds phosphoric acid, 70 pounds of nitrogen and 50 pounds of potash. The required amounts of phosphoric acid in 400 and 1,000 pounds respectively of this mixture would be supplied by 175 and 438 pounds of 16 per cent acid phosphate; the nitrogen by 215 and 538 pounds of 13 per cent dried blood, and the potash by 100 pounds and 250 pounds of 20 per cent manure salt. Other materials or other grades of these same materials may be used, and it will not be difficult, knowing just what they contain, to use such quantities of them as will be necessary to furnish the required amount of plant food, having in mind that it is the specific number of pounds of phosphoric acid, nitrogen and potash that is desired, rather than a given weight of mixed fertilizer.

It is not more, but perhaps less difficult to calculate the number of pounds of nitrogen, phosphoric acid, and potash to be applied per acre to any given crop from materials which are to be had than to estimate the exact number of pounds of materials to make a formula of a certain composition; as, for example, in an 8-2-2 goods. The question of filler does not have to be considered in doing this, as is necessary in making a fertilizer formula in the usual way. When it is desired, for instance, to apply the equivalent of 400 pounds per acre of a fertilizer mixture containing 7 per cent of available phosphoric acid, 7 per cent of nitrogen and 5 per cent of potash, or 28 pounds of phosphoric acid, 28 pounds of nitrogen, and 20 pounds of potash, it is only necessary to divide the number of pounds of plant food desired per acre (28, 28, and 20) by the percentage composition of the materials to be used, as follows:

Number of Pounds of Plant Food per Acre Wanted	÷	Percentage Composition of the Materials to be Used	=	Number of Pounds of Fertilizer Materials per Acre to Apply
Phosphoric Acid.....28 Lbs.	÷	16% Acid Phosphate.....	=	175 Pounds.
Nitrogen.....28 Lbs.	÷	13% Dried Blood.....	=	215 Pounds.
Potash.....20 Lbs.	÷	20% Manure Salt.....	=	100 Pounds.

With cotton planted on the coarse sandy or fine sandy loam soils of the Coastal Plain section of the State, which have open or only moderately retentive sandy clay subsoils, it has generally been found most profitable to divide the whole fertilizer application into two parts, putting in one-half in the drill at planting and reserving the other half to be applied alongside the row as a side dressing about July 1. However, instead of this, if the soil is not of too open a nature, all the phosphoric acid and potash with one-half of the nitrogen in the form of cotton-seed meal, dried blood, or some other form of available organic nitrogenous material may be put in at planting of the cotton and the remaining half of the nitrogen reserved to be applied in a more immediately available form, like nitrate of soda, alongside the rows about July 1, after the plants have gotten well started in their growth and the roots have fairly well filled the soil.

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LEAF TOBACCO SALES FOR FEBRUARY, 1914.

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Pounds sold for producers, first hand.....	8,931,236
Pounds sold for dealers .....	379,904
Pounds resold for warehouses .....	601,560
Total .....	9,912,700

**THE BULLETIN**  
OF THE  
**NORTH CAROLINA**  
**DEPARTMENT OF AGRICULTURE,**  
**RALEIGH**

Vol. 35, No. 5.

MAY, 1914.

Whole No. 196.

**INSECT ENEMIES OF CORN**



**SUGAR-CANE BEETLE.**

BEETLE AT WORK IN CORN STALK AT RIGHT. INJURED STALK AT LEFT.  
NATURAL SIZE. SEE PAGE 41.

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‡In coöperation with Bureau of Plant Industry, United States Department of Agriculture.

## LETTER OF TRANSMITTAL.

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HON. W. A. GRAHAM, *Commissioner.*

SIR:—I submit herewith manuscript for a Bulletin on "Insect Enemies of Corn." Corn is our most important crop, and the total damage done to it by insects is enormous. The Bulletin which we issued upon this subject in May, 1905, has been exhausted, and the matter which it contained has here been rewritten to include later observations and to avail ourselves of many excellent publications on corn insects which have recently appeared from other States, thus bringing, so far as I am able, the best present information into shape available to our farmers. The general plan of the older Bulletin has been retained, as also the illustrations.

I recommend its publication as the BULLETIN for May, 1914.

Very respectfully,

FRANKLIN SHERMAN, JR.,

Approved for printing:

*Entomologist.*

W. A. GRAHAM,

*Commissioner.*

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# INSECT ENEMIES OF CORN.

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By FRANKLIN SHERMAN, JR., Entomologist.

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## INTRODUCTION.

Nearly one-half of all the land planted in crops in North Carolina each year is devoted to corn. The yearly money value of the total crop is estimated at \$70,000,000.

Insects are estimated to destroy approximately one-tenth of the total value of our crop products. Allowing that corn suffers its proportional share, we are brought to the conclusion that the corn crop in North Carolina suffers an average loss of \$7,000,000 per year from insect pests.

Nor can it be said that this is an exaggerated estimate. What with wire-worms, cut-worms, bud-worms, bill-beetles, stalk-borers, chinch-bugs, ear-worms, weevils, and others, the corn plant certainly seems to suffer its full one-tenth loss. The writer has frequently known of cases in this State where one species of pest alone has destroyed from one-half to three-fourths of the entire crop; a total loss has been reported in some instances. Injury by insects frequently makes replanting necessary, and this is always a serious loss of time, labor, seed, and use of land. Putting the matter in its mildest light, the loss certainly runs well up among the millions.

The object of this Bulletin is to show how and where these losses occur, to describe the insects responsible for them, and set forth the remedies or methods which may be employed in preventing or avoiding these injuries.

A Bulletin on "Insect Enemies of Corn" was issued in May, 1905,\* but the edition has been exhausted. The continued demand for information about corn insects makes a new issue desirable. The work of the county demonstration agents, the boys' corn clubs, the teaching of agriculture in many of our public schools, and many other commendable factors, have all increased the interest in the corn crop, and in the enemies which attack corn.

In the present Bulletin the descriptions of the insects and the account of injuries in North Carolina are based on our own observations, correspondence, etc. The accounts of life-histories, remedies, etc., are gleaned from all available reliable sources, including text-books, bulletins, etc., as well as our own observations. A great work yet lies ahead in the working out of the exact, detailed life-histories of our Southern corn insects and in determining with exact, scientific accuracy the degree of

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\*Vol. 26, No. 5, Bul. N. C. Dept. Agr., May, 1905, "Insect Enemies of Corn." F. Sherman.

protection that can be secured from them. The most that we can pretend to do here is to present the general facts, with such recommendations for control as seem, from present even incomplete evidence, to offer the best hope of relief. The illustrations are the same as in the previous Bulletin.

#### GENERAL CONSIDERATIONS.

In dealing with insect pests on corn, it must be constantly remembered that the crop is of relatively low commercial value, the margin of actual profit is small, hence expensive measures are not justifiable except in limited areas where their use will prevent the insects from spreading over larger areas. It may not be profitable to spray a whole cornfield to kill insects, yet the spraying of a few rows or a certain portion of the field may be profitable if by that means the pest can be prevented from spreading farther. The small margin of profit on the crop as a whole renders it difficult or impossible to combat some of the pests satisfactorily.

Again, corn is grown on such large areas and there are so many individual plants in a field that the treatment of each individual plant is usually out of the question.

Therefore, in combatting many of the insect pests of corn we must rely on such methods of culture and handling of the crop as shall render it least liable to injury; in other words, the treatment must be *preventive* rather than *curative*—and this frequently necessitates taking the insects into account before the crop is planted, even in the very selection of the lands where it is to be planted, or, in severe cases, even modifying the manner of rotation of the crops which shall precede the corn. How far one is justified in going in recasting the plan of his farm operations to protect his corn from injury will of course depend upon how severe the injury is, and upon the value which he places upon the corn crop itself.

#### CULTURAL CONSIDERATIONS.

By changing or modifying the methods of culture much may be done to avoid insect injury. This is so important that we will consider it in more detail.

**Rotation.**—Any system by which corn follows grass or a growth of weeds is injurious, from the standpoint of insect pests. Where land just from sod is put in corn, the crop suffers more from wire-worms, white grubs, root web-worms and cut-worms than it does when it follows a cultivated crop like cotton. Suppose we have a field now in sod which we wish to bring into cultivation: A system of rotation which will give the minimum amount of insect injury to the corn might be arranged as follows: First year, plant the field in a small grain, and after that in peas. Second year, cotton, potatoes, cabbage or other cultivated crops.

Third year, corn (peas may also be grown with the corn). Fourth year, small grain and peas again, and so on. A shorter system may be used, but it is *best* to have corn at least two years removed from a growth of grass or weeds, and it is *advisable* to have it separated from small grain by one year in a cultivated crop. Of course such a plan may not always be feasible, but it is best so far as avoiding insect injury is concerned, and the nearer we can come to it the better. The employment of peas in the rotation is beneficial from all points of view. Not only do they tend to improve the land, but they do not in any way render the corn more subject to insect injury.

Corn following corn year after year is also favorable to the increase of certain insects (stalk-borers), and a two-year rotation with merely cotton and corn is favorable to some pests, especially ear-worm and root-louse. Hence, while corn and cotton may follow each other occasionally, they should not always do so, and they should at least sometimes be separated by some other crop between them so as to interfere with those pests which feed on both cotton and corn.

**Fertilization.**—A crop of corn which has been put into healthy condition by fertilization, whether by commercial or farm manures, is better able to withstand and recover from insect attacks than one which has not been so aided. Here the peas serve a useful purpose. It has also been claimed that where heavy applications of kainit or other salty fertilizers are used the wire-worms, cut-worms and other underground insects are checked to a considerable extent.

**Fall or Winter Plowing.**—As a general rule, it may be poor policy to plow land in the fall and leave it bare all winter. If, however, a field which is in sod is to be planted in corn it will be well to adopt this method of fall plowing in order that the wire-worms, cut-worms and other soil-inhabiting insects may be starved out, killed by exposure, or driven away, before the crop is planted in the spring, especially if these pests are known to be usually destructive in the locality. The plowing should be deep, so as to thoroughly break up and pulverize the soil.

**Time of Planting.**—This has an important bearing on the amount of insect injury that the corn will suffer later on. Corn planted late is not so much hurt by either cut-worms or stalk-borers. In the eastern part of the State some good farmers claim that corn planted *very early* will often partially escape the bill-beetle (not always nor completely). In the eastern section also, very early (or very late) planting may avoid part of the injury by bud-worms; while in the western half of the State late planting of corn seems to be the best method of escaping bud-worms.

**Planting Increased Quantity of Seed.**—Injury by some insects, such as wire-worms, white grubs, bud-worms, and cut-worms, may occur largely before thinning time (especially if the corn is planted late), so that if

an extra quantity of seed is planted a stand may be secured even if some is destroyed by insects. Any surplus that remains can then be gotten rid of by thinning. There used to be a commonly quoted rhyme in this connection:

“One for the cut-worm,  
And one for the crow,  
One grain to rot, and  
Two grains to grow.”

The idea here is the planting of extra seed so that there will be a stand left in spite of poor germination and damage to the young stalks. This is a very simple expedient, though it does not in any way decrease the number of pests.

**Cultivation.**—Frequent and thorough cultivation of the soil not only stimulates the corn to a better growth, but acts as a decided check to cut-worms, wire-worms, root-lice, and other insects living in the soil. The cultivation can be more thoroughly practiced when corn is planted in checks, so that it can be cultivated both ways, than when the ordinary method is used.

**Selection of Lands.**—Wire-worms and bud-worms are worse in lowlands. It should be remembered, therefore, that when other considerations do not interfere, it may be well to avoid the very low situations.

**Disposition of Remnants.**—Throughout the southern states it is a common custom to “pull” the fodder, leaving the stalks standing in the field, often with the shucks attached, until the land is needed for other purposes, when they are beaten down and plowed under. Such a practice is detrimental from the standpoint of one who wishes to avoid insect injury. If the fodder were cut at the ground (or as close to it as practicable) and the stalks and leaves shredded or made into ensilage, a reduction of insect injury should result, and the value of the fodder and grain would both be increased by the process. Many insects find hibernating places in these stalks and husks. Chinch-bugs, grain weevils, and stalk-borers are all favored by this custom of “pulling” and leaving the stalks, and all will be more or less reduced by abandoning the custom and making use of the shredder and the silo. Even the plowing out, raking together and burning of the stubs will sometimes be advisable.

In some of our extreme northeastern counties it is the regular practice of many farmers to burn the stalks, under the idea that this destroys bill-beetles; but we question the advisability of this, for the land needs the humus of the stalks. If the stalks be cut and fed as fodder or ensilage and the remaining *stubble* be plowed out, raked together and burned, the whole result, in our opinion, would be better.

**Ideal System to Avoid Insect Injury.**—Having gone into some detail with these cultural considerations, it is well now to summarize with a

statement of the system to be followed if one aims to incur the minimum amount of insect damage to his corn crop :

*The field should be on land well drained and of sufficient elevation not to be subject to overflow. It should be at least two years out of sod, and the year previous to corn should have been in some hoed or cultivated crop. If there is much growth of weeds or grass on the land, it should be plowed in the fall. The land should be deeply plowed, thoroughly prepared. The time of planting may be modified according to location and severity of insect pests, as already discussed. The young corn should be given frequent and thorough cultivation. At harvest the stalk should be cut at the ground and shredded or made into ensilage; the remaining stubble can be plowed out, raked together and burned.*

The writer understands perfectly that such a system as this cannot always be carried out in all details, but he does claim that such a system will involve a minimum of insect risk, and the system is closely in accord with the best farm practice.

#### REGARDING INSECTS AND THEIR NAMES.

In considering the corn insects in this BULLETIN, we have confined the main discussion to those which have actually been known to do serious injury to corn in this State; the lesser pests are discussed briefly.

In discussing each pest, we have given both the popular (common) and scientific names of the species, and have indicated the *order*, and under the order the *family* of insects to which each belongs. This makes for accuracy and definiteness. It should be remembered that the *Order* is the more comprehensive group, and that each order is divided into a number of *Families*.

The great majority of our insects fall into seven orders, and there are some ten or twelve other smaller and less important orders. These seven principal orders are :

1. The *Orthoptera* (Or-thop'-te-ra), including the Grasshoppers, Katydids, Crickets, Roaches, etc.
2. *Hemiptera* (He-mip'-te-ra), Bugs, such as Chinch Bug, Squash Bug and Terrapin Bug, Plant-lice and Scale-insects.
3. *Neuroptera* (Neu-rop'-te-ra), Lace-wings, Dobsons, etc.
4. *Lepidoptera* (Lep-i-dop'-te-ra), Butterflies and Moths.
5. *Diptera* (Dip'-te-ra), the true two-winged Flies, such as House-flies, Mosquitoes, Blow-flies, Horse-flies, etc.
6. *Coleoptera* (Co-le-op'-te-ra), Beetles, such as Potato-beetle, Bill-beetle, Flea-beetle, June-beetle, Tumble-beetle, Tiger-beetle, etc.
7. *Hymenoptera* (Hy-men-op'-te-ra), Bees, Ants and Wasps.

Of these seven orders the Neuroptera, Diptera and Hymenoptera contain no very serious pests of corn, but all the others will be found referred to in the following pages.

It is believed that this arrangement will be of use to those who are interested in learning how to recognize the different orders of insects, and to all readers who wish to make their knowledge exact.

### INSECT ENEMIES OF CORN.

**WIRE-WORMS** (*Several Species*). Order *Coleoptera*. Family *Eluterida*.  
(Also sometimes called "Drill-worm.")

*Description*.—Slender, smooth, firm-bodied, yellowish-brown worms (larvæ), attaining length of one to two inches, which destroy the corn by eating the seed before it comes up, or by eating roots, or into the stalk just below the surface of the ground, causing the center of the growing part to die. The adult insect is a "Jack-snapper."

*Injury in North Carolina*.—Any insect which does its work underground is not likely to attract attention except in cases of serious injury; hence the complaints made of these pests cannot be an adequate measure of the damage done by them. It is quite certain, also, that farmers often confuse injury by Wire-worms with that done by bud-worms, so that what is attributed to one may in reality be due to the other.

From the letters of complaint which have come to us in regard to Wire-worms, we give the following quotations, all of which throw some light on the nature or extent of damage or the habits of the insects:

"It gets in the root of the corn and kills it at any age from time it comes up until a foot high. In a 20-acre field I believe they have killed 14 per cent, and are still killing. They do most damage in lowlands."

"A yellow worm works in the roots and kills the corn in low wet land."

"Very destructive to corn on black lowlands. They attack the corn from the root and go up the pith and kill it entirely."

"Destroying the corn in this county before it gets out of the ground; my bottom-land is thoroughly infested. Many of my neighbors are in the same position as I am."

"Damaging corn in meadow after sod."

"Present by the bushel in a piece of my land this year."

It is not to be inferred that Wire-worms attack only corn. They feed on roots of many plants, also on seeds and tubers. One correspondent sent an irish potato which had been bored through and through by them. Some feed mainly or exclusively in decaying vegetation, rotting wood, etc. In this State they are a recognized tobacco pest.

While on a tour through the Piedmont counties to inspect wheatfields in the middle of April (1905), the writer several times noted more or less injury to wheat by Wire-worms. No doubt corn sown on similar land suffered in the same way, only in *greater degree*, since the number

of corn plants is small compared with wheat and the injury would be more concentrated. The following extracts from my notes on this trip will be of interest in this connection:

*Greensboro, April 11, 1905.*—Noted injury to wheat by Wire-worms eating off stem and roots at and near surface of ground. Noted at several places, though never serious.

*Lexington, April 12, 1905.*—In one field found very considerable injury by Wire-worms. Land had previously been in broom-sedge, as evidenced by tufts of sod in the field.

*Statesville, April 13, 1905.*—Noted some injury.

On April 20 (1905) the writer went to Warren County to investigate a Wire-worm outbreak. The infested field was a fine piece of meadowland, reclaimed from swamp by drainage, and was cultivated (to corn) the year before for the first time, when Wire-worms destroyed practically every stalk. During the summer the land grew up in grass and weeds again and was not plowed until spring, when the soil was found to be still badly infested. The larvæ were still to be found in almost any foot of soil examined; they were apparently of different ages, some about full-grown. No pupæ nor adults were found.



FIG. 1.—Adult and larva of Wire-worm. It is the larva or worm form that does the damage. The adult beetle is known as a "Jack-snapper" and does no harm other than to lay the eggs.

(After Comstock and Slingerland.)

There are many species of Wire-worms, and though the kinds cannot always be distinguished in the Wire-worm stage, yet of the adult beetles over seventy species are already known to occur in North Carolina, and there are probably as many more not yet on record. But it is probable that only a few of our species are seriously destructive.

In June, 1911, a correspondent sent adult beetles of Wire-worms and said they were doing serious injury to his corn, but his description fitted the work of the Wire-worms themselves. No doubt the larvæ were still doing injury, but some were coming out in the mature beetle form, and it was these which he found.

*Life-history.\**—Wire-worms are the young, or larvæ, of the beetles which are called "Jack-snappers," "Snap-jacks," "Click-beetles," "Hominy-beaters," "Elaters," "Thumping-beetles," and other similar names. The beetles have these names because of their power to spring suddenly into the air when placed on the back.

\*Much of what is known of exact life-histories of Wire-worms comes from the work of Dr. Forbes in Illinois. (Bul. 44, Ill. Exp. Sta., "Ins. Injuries to Seed and Roots of Corn," May, 1896.) Extensive experiments are also reported by Professors Comstock and Slingerland of the N. Y. (Cornell) Exp. Sta.

The following account will give a general idea of the history of those species that attack corn, the details probably varying somewhat in the different species:

Many of the adult beetles pass the winter in dead wood, under bark, under trash, boards, leaves, at the base of tufts of grass, etc. In the summer they lay eggs, usually depositing them in grassy places. The larvæ hatching from the eggs are slender, smooth, yellowish-brown in color and firm in texture, and are called "Wire-worms." They burrow through the soil, feeding on various seeds and roots which they may find. It is thought that it takes most species from two to three years to reach maturity. Then they change to the stage known as the *pupa* in a cell in the soil. While in the pupa state they are quiet and take no food, but are going through the change from larvæ to adult beetles. After a few weeks in the pupa state the insect changes to an adult beetle. Some of the beetles emerge and pass the following winter in sheltered places; others do not emerge until the following spring.

*Summary.*—It will be noticed from the foregoing account that Wire-worms are more destructive on lowlands, and that they are worse on lands which have been in sod. They feed on seeds, roots, and stems. It is probable that they do not attack corn or other cultivated crops because they especially like them, but because when sod lands are broken up they are already in the soil, their natural food is destroyed, and they must take what is planted. It takes from two to three years for a generation to reach complete maturity, and adults deposit eggs mainly in sod lands. With these facts in mind, we can better appreciate the recommendations which follow.

#### REMEDIES.

The first consideration in attempting to avoid injury to corn by Wire-worms is not to allow corn to follow directly after sod. If corn must follow sod, plow the land in the fall and stir once or twice during the winter. These measures will starve and kill by exposure many of the larvæ and will break open the little cells in which the newly formed adults are passing the winter and kill the insects. By avoiding low lands (especially low *sod* lands) much injury will be averted. Good fertilization and frequent tillage will also check the insects or enable the corn better to recover from their attacks.

In regard to corn after sod, it should be remembered that most species of Wire-worms are thought to take two or three years to become full-grown, hence it is well to have the land in some other crop not so subject to injury during the first year from sod, so that the majority of the insects will have had time to mature and deposit their eggs elsewhere.

But Dr. Forbes in Illinois states that they "are much more likely to do serious mischief the *second* year after the breaking up of the sod," which would indicate that in severely infested fields it would be better

to have some crop other than corn on the land for *two years* after sod.

In Massachusetts, Dr. Fernald reported good results by planting seed coated with gas-tar and then dusted in a bucket of fine dust and Paris-green sufficient to give the corn a greenish color, this apparently repelling the insects and not affecting germination.<sup>1</sup>

The cultural methods here referred to are further discussed under the heads of Rotation (p. 6), Fertilization (p. 7), Fall Plowing (p. 7), Planting Increased Quantity of Seed (p. 7), Cultivation (p. 8), and Selection of Lands (p. 8).

#### WHITE GRUBS (Several Species).

Order *Coleoptera*. Family *Scarabæidæ*.

*Description*.—Thick-bodied whitish grubs reaching a length of 1½ inches; when disturbed, often curling up tightly; infesting sod lands or fields where much manure or decaying vegetation is present; living underground and doing damage by eating roots from corn, grasses, or other plants. When fully grown they change to brown "May-beetles," or green "June Bugs."

*Injury in North Carolina*.—As with other underground insects, injury by White Grubs is apt to pass unnoticed unless it becomes very serious, and also their presence in gardens and cultivated fields is taken so much as a matter of course that definite complaints of their injuries are infrequent in this State. But it cannot be otherwise than true that the total damage by them to our corn crop is considerable.

During inspection of wheat-fields in the spring, we have found these Grubs doing injury, though usually not to a serious extent.

White Grubs have been complained of to us as a pest in gardens, lawns, greenhouses, in grass fields, and in farm crops. But the most serious and definite complaint we have ever had came in August, 1913, from Mr. George F. Ogilvie, Oakwoods, Wilkes County. As this was evidently a typical White Grub outbreak, I quote from Mr. Ogilvie's letters, as showing the extent to which these pests may do damage:

"I have a few patches that I have been manuring up with stable manure, and at this time thousands of large White Grubs work under the manure. They throw up the dirt until one's feet sink in it. Where I have sown small seeds like spinach, they have completely ruined it. I have used on some plats a very large quantity of ashes, and yet the grubs are everywhere, even where you can see the ashes in the land."

(LATER) "Since I wrote you, they have been worse. I resowed my spinach plat, and they have again completely ruined it. I never saw anything like it: the whole surface of the ground is heaved and churned up until one sinks almost over the shoes."<sup>2</sup>

<sup>1</sup> This statement from "Insects of Farm, Garden, and Orchard," by E. D. Sanderson, p. 83. I have not at hand the original report on the Massachusetts experiments.

<sup>2</sup> An interesting fact in this connection is that twelve years before this time, when I was in that vicinity on other work, Mr. Ogilvie was mentioned to me as a man who took special pains to manure his land heavily.—AUTHOR.

We have indicated that there are several different species of the White Grubs. As with the wire-worms and cut-worms, many of the species seem to do but little injury, while the greater part of Grub injury is probably due to only six to a dozen species. Of the groups of beetles to which they belong, however, we have evidence of not less than thirty-five to forty kinds in the State, with no doubt many more awaiting discovery.

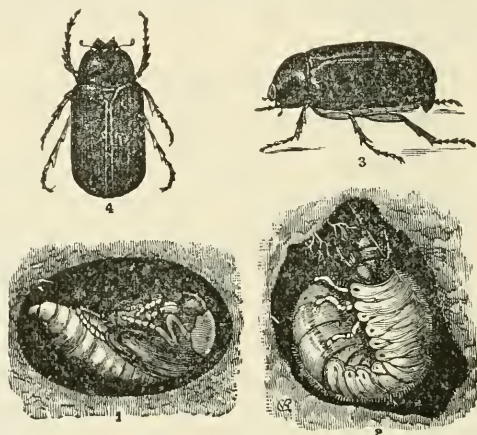


FIG. 2.—White Grubs. Showing adult beetles at 3 and 4. Larva eating roots of plants at 2, and pupa at 1.

(After Riley, Div. Ent., U. S. Dept. Agr.)

*Life-history and Habits.*—The most comprehensive work in this country on the life-histories and habits of White Grubs and their adult beetles has been done at the Illinois Experiment Station under Dr. S. A. Forbes.\* But in the space of this BULLETIN we can only give a general condensed account of the life-history.

The adult beetles appear in spring and early summer; they are the common brown "May-beetles" which often enter our houses at night, or the green "June-bugs," so familiar to children. The beetles mate and the females deposit their eggs preferably in grassy or weedy fields. The eggs hatch into the "White Grubs," small at first, but growing with age to from 1 to 1½ inches in length, feeding upon roots of many plants. The exact length of time required for the Grub to attain full growth is uncertain, but seems to be from two to three years. It then changes to a pupa, in a cell in the soil, and the pupa changes to a mature beetle, which, however, may not emerge to live an active beetle life until the following spring. In the writer's personal experience it is a common thing to unearth the adult beetles in gardens in fall, winter, or spring.

\*Among the several publications on this subject by Dr. Forbes I have been especially interested in Bul. 116. Ill. Exp. Station. "Life-history, Habits, etc., of White Grubs."

No doubt some species complete a generation quicker than others, or even in the same species the period may vary according to heat or cold, moisture or dryness.

Every careful observer knows something of the habits of the adult beetles. The green June-beetle usually appears at Raleigh around the first of July, and may be found abundantly feeding on ripe figs, grapes, peaches, and other fruits. The brown May-beetles are evening or night fliers, and often congregate on trees at dusk, where they eat the foliage.

#### REMEDIES.

Hogs, chickens, and some wild birds are fond of White Grubs, and to some extent can be made use of in combatting these pests. In garden plats or in small patches of corn much can be done by encouraging poultry to follow the plow or the spade, or by merely gathering the Grubs which are exposed and feeding them.

Cornfields which are known to be badly infested by them can surely be largely freed from them by turning in hogs after the crop is off, especially if by scarcity of feed or otherwise they are encouraged to root diligently. Dr. Forbes reports a case in which 100 pigs destroyed over 90 per cent of the Grubs in a badly infested 10-acre field in less than a month.

As the Grubs are more likely to be abundant and destructive in lands taken from sod, their injuries to corn can in some measure be prevented by putting lands fresh from sod in some other crops for the first year (or, better, two years) by which time the majority of the Grubs will have matured.

See, also, Rotation (p. 6), Fertilization (p. 7), Cultivation (p. 8).

#### **CUT-WORMS (Several Species).** Order *Lepidoptera*. Family *Noctuidæ*.

*Description.*—Rather stout-bodied, soft, brown, blackish or grayish caterpillars, which remain concealed during the day and do great injury at night by eating off various kinds of young succulent plants at or near the surface of the ground.

*Injury in North Carolina.*—Everybody knows what Cut-worms are. So well known and so universally common and destructive are they that their injuries in ordinary seasons excite no particular interest or comment. Everybody takes it as a matter of course to lose a part of his cabbage, tomatoes, tobacco, corn, or any other green succulent crop, from their ravages. Like the potato-beetle and the house-fly, people take them so much as a matter of course that many persons give them no serious attention, and the complaints received of their injuries is in no sense a measure of their destructiveness. Most of the complaints that are made refer to their injuries in gardens, or flower-beds.

In 1901, specimens were sent from Moore County with the report that they were a scourge that year, and that the correspondent could not get a stand of melons until after the worms matured; he had found as many as ten or twelve around one dewberry vine. He also reported them as destroying beans, cabbage, leaves on young peach trees, etc.\*

During 1905, reports of serious Cut-worm damage were frequent, indicating damage to many crops, including corn, cabbage, and tomatoes. Cut-worms are also recognized as a regular and serious pest to tobacco.

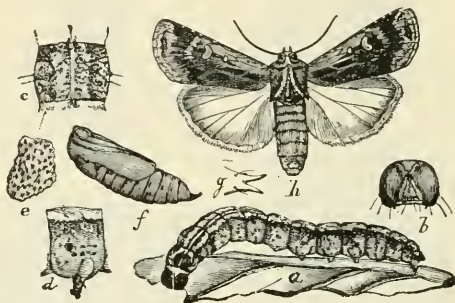


FIG. 3.—The Granulated Cut-worm (*Feltia annexa*), showing larva (a), pupa (f), adult moth (h), and details of structure.

(After Riley and Howard, Div. of Ent., U. S. Dept. Agr.)

*Life-history and Habits.*—As with the wire-worms, so with Cut-worms: there are a number of different species concerned. They are all the caterpillar stage, or larvæ, of moths, and the family *Noctuidæ* to which they belong contains upward of two thousand species. The larvæ of all of these would not be considered as true Cut-worms, however, and of those which could be truly classed under that name there are probably not more than thirty or forty species that are ever serious pests in the eastern United States. From our scattered observations we believe that 95 per cent of all the Cut-worm injury in this State is caused by not more than six or eight species.

Much work yet remains to be done in rearing our southern Cut-worms to the adult state before it will be possible to give in detail the life-history of all of our common species. Some species mature and emerge as moths in early summer, while others emerge as moths in the fall. Thus far we have observed no species which is seen in the adult state both in summer and fall; so that it seems that they are all single-brooded, some of the species emerging as moths in early summer and other species emerging in the fall.

Mr. C. S. Brimley of Raleigh, who has long taken an interest in collecting, rearing, and studying insects, reared to maturity a number of

\*From letter from R. W. Caviness (deceased). Mr. Caviness was an excellent observer.

Cut-worms during 1903-'04. The notes here given refer to the dates on which the adult moths emerged in Mr. Brimley's cages, or when adult moths were captured:

The Granulated Cut-worm.—*Feltia annexa*, Treit, August 29, September 20, October 7, 12, 1903.

*Feltia hirilix*, Grote, September 17, 25, 1904.

The Dingy Cut-worm.—*Feltia subgothica*, Hawworth, September 12, 27, 1904.

*Prodenia commelinæ*, Sm. and Abb., August 17, 1904.

*Peridroma saucia*, Hub., June 22, 23, 24, 1903.

Other species, not identified, emerged as follows: Species No. 1 (spring species), June 4, 28, 1903. One captured (not bred) May 30, 1902. Species No. 2 (fall species), October 7 (2 specimens), 12, 1903.

From these notes it seems that for the spring species June, and for the fall species September and October, are the principal months of activity and egg-laying by the adult moths.

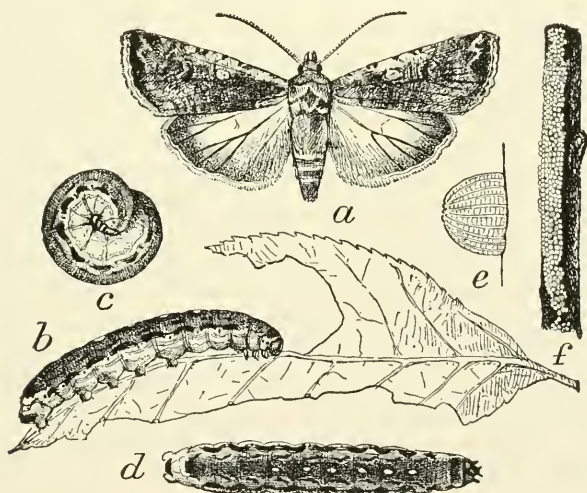


FIG. 4.—Another Cut-worm (*Peridroma saucia*) showing adult moth (a), larva (three views) (b, c and d), egg (enlarged) (e), and eggs in natural position on grass stalk (f).

(After Howard, U. S. Dept. Agr., Div. Entomology.)

Of course, the details in the life-history of a species will vary somewhat according as it matures in the spring or in the fall; but the following will serve as a condensed account:

The larvæ (the destructive Cut-worm stage) pass the winter in the earth, or on the surface under such shelter as they can find, in a partly grown condition. The long fast of winter gives them ravenous appetites when the warm days of spring arouse them to activity, and they feed on any green succulent young plants that they can find. Some species have the habit of climbing trees or other plants to eat the tender expand-

ing leaves, but those that are most destructive to corn do their damage by eating off the young stalks at or near the surface of the ground. Sometimes the severed stalk (if it be young and small) is dragged partially into the ground. The worms usually remain quiet during the day and feed mainly at night. Sometimes, however, they will work during the day if the weather be cloudy. Cool weather seems to sharpen their appetites. When the larvæ become grown (which varies according as the moth is to emerge in spring or fall), they change to pupæ in the earth, an inch or so under the surface, sometimes only barely covered by the soil. Those that are to emerge in spring change to pupæ about the middle or latter part of May; and it is because these larvæ *become mature* at this season that they cease their injuries, and not usually because of any epidemic of disease among them. In the pupa state they are without legs or wings, and take no food—it is simply a stage of transition from the larvæ to the adult moth. After a few weeks in the pupa stage the adult moth bursts from the pupa-shell. Most of the Cut-worm moths are dull gray or brown in general color, marked with lighter streaks or spots, and with the hind wings lighter in color, sometimes of a pinkish hue. When the wings are expanded they measure from one to two inches from tip to tip. These moths fly mostly at night and are often attracted to bright lights and not infrequently enter houses and flutter about the lamps or walls. The females deposit their eggs on trash, grass or weeds, in sod or weedy lands, and the larvæ become partly grown by winter and hibernate as already explained.

*Summary.*—Cut-worms are the larvæ of night-flying moths. They pass the winter as larvæ, eat voraciously in the spring, become mature, pupate, and emerge as moths in early summer or fall, according to the species. June, September and October seem to be the principal months for egg-laying. Eggs are deposited in weedy or sod fields, after which the moths die. The larvæ pass the winter in a partly grown condition in the fields. With these points clearly understood it will be easy to comprehend the following remedial suggestions:

#### REMEDIES.

As the eggs are laid principally in sod or weedy lands, corn planted on land just from sod or weeds is likely to suffer from Cut-worms. They are often numerous in clover sod also; yet corn after clover does so remarkably well that in general it pays to take the risk. If the corn must come after a growth of grass or weeds, then by plowing the land in fall or winter many of the Cut-worms will be killed or starved before spring. This result has been several times reported by farmers. In 1905, Mr. G. M. Bentley, at that time an assistant in this office, made some observations on Cut-worm injury to tobacco in Wake County. On a small plat which was plowed March 19th, he found seven plants destroyed, while on an adjoining plat of same size, with same number of

hills, plowed one month earlier (February 22d), he found only two plants destroyed. So far as this observation went, therefore, it showed that land plowed in winter was much less infested than land which was not plowed until spring.

By delaying the planting until moderately late in the spring, those Cut-worms which mature to moths in the spring will be nearly or entirely grown, and will therefore not do serious injury, and the extra time can be given to a more thorough preparation of the land. Frequent cultivation as soon as the corn is up will also disturb the Cut-worms in the soil and deter them in some degree.

But if we must put a piece of spring-plowed sod or weedy land into corn, and wish to plant at the normal season, there is still a method (not always easy or entirely satisfactory, perhaps) by which we may combat the Cut-worms. When the land is plowed in the spring much of their food is destroyed and they become hungry. It is then, after breaking and harrowing the land and before the corn is planted, that it is possible to poison them. Clover or other green and succulent vegetation may be poisoned with Paris-green and distributed through the fields as a bait to the worms. The clover may be sprayed as it stands and then cut; or perhaps the better and more thorough plan would be to cut it and dip it into a barrel of the poisoned solution. The Paris-green for this purpose should be thoroughly mixed with water at the rate of about one pound to the barrel (40 to 50 gallons) of water. Arsenate of lead may be used instead of Paris-green, at the rate of five or six pounds to the barrel. Paris-green and wheat bran have been used in gardens, at the rate of about one ounce of the poison to two or three pounds of the bran. A mash made of bran, Paris-green and water, and sweetened with molasses, has also been used by gardeners.

But in field operations with corn grown on a large scale, the main practices to be relied upon are:

- (1) Avoidance of corn after sod or weeds;
- (2) Fall or winter plowing, or very early in spring, if sod lands are to be put in corn;
- (3) Moderately late planting.

For further discussion of the methods mentioned, see Rotation (p. 6), Fall Plowing (p. 7), Time of Planting (p. 7), Planting Increased Quantity of Seed (p. 7), Cultivation (p. 8).

#### THE CORN (AND COTTON) ROOT-LOUSE. (*Aphis Madai-radidis*, Forbes.)

Order Hemiptera. Family Aphididae.

(Also called "Blue-bug," "Blue-louse," "Blue Root-louse.")

*Description.*—A small greenish or bluish plant-louse attacking the roots of young corn, causing it to be of slow, belated growth or unhealthy color. Their presence often indicated by ants entering and leaving the ground at the hill.

*Injury in North Carolina.*—In this State this Root-louse has not often been reported on corn, though it does injury to this crop. It is much more often reported as a pest of cotton, and the writer believes that the first published record of it as a really serious cotton pest was in a Bulletin of this Department.<sup>1</sup> Injury to corn, however, has been reported several times in recent years, from the counties of Bladen, Caldwell, Forsyth, Gaston, and Union. As it is a pest of cotton chiefly in our eastern counties, has been reported on corn to the edge of the mountains, and is known as a corn pest throughout the entire State of Illinois, we must conclude that it does attack corn throughout the entire length and breadth of North Carolina, even though definite complaints of it on this crop have been few. Like the other underground insects, it is likely to pass unnoticed except in the most aggravated cases.

*Life-history.*—Here again we must acknowledge our indebtedness to the work of Dr. Forbes in Illinois. Not only was he the original describer of the Corn Root-louse as a species, but what is known of its exact life-history comes largely from the work of his office. Working in a great State the chief crop of which is corn, he has studied carefully the insect enemies of that plant, and many of his publications have discussed this Corn Root-louse, and the relation which the attendant ant bears to it.

Dr. Forbes says that the first generation of Root-lice in the spring are all wingless, and if the plants on which they feed remain thrifty, many generations in succession will be wingless; but that if the plant becomes overcrowded by them and seems likely to die, then many of the oncoming generations have wings which enable them to migrate in search of new plants. Such stray lice are found by the ants which attend them, and are quickly placed on roots of plants which will support them—on corn if in a cornfield. Here they multiply until the approach of winter. All this time, from the opening of spring through many generations, *only female* Root-lice are produced, all being born alive (no eggs); but as cold weather approaches in fall, the last generation contains both *males and females*; these mate, and the fertilized females *lay eggs* which pass the winter and hatch to wingless females in the spring. In Illinois Dr. Forbes finds an average of about sixteen generations per year.<sup>2</sup> The louse is largely dependent upon the cornfield ant, for this ant stores the eggs of the Root-louse in its burrows over winter, and when they hatch in spring they place the young lice on the roots of plants upon which they can feed. The lice secrete from their bodies a sweetish substance known as "honey-dew," and it is to obtain this that the ants attend the lice. The ants themselves do not hurt the corn (or cotton), nor do they give birth to lice, nor do they de-

<sup>1</sup>Vol. 29, No. 6. Bul. N. C. Dept. Agr., June, 1908, "Insect Enemies of Cotton," by F. Sherman, p. 17.

<sup>2</sup>Account condensed from "The Corn Root-aphis in Illinois." Circular of Ill. Exp. Sta., Jan., 1913, by S. A. Forbes.

stroy the lice. They are an entirely distinct species of insect and attend the lice for the purpose of securing the honey-dew.

Although with us this Root-louse is recognized as a pest only on cotton and corn, it is known to feed on the roots of many other plants which may tide it over in places or in seasons when corn or cotton are not within its reach.

#### REMEDIES.

Throughout our cotton-growing region the time-worn two-year rotation of corn one year, cotton the next, and then back to corn again, acts directly in favor of the increase of this louse, for it feeds upon the roots of both these plants. Hence a rotation which shall at least every third year put some crop on the land other than cotton or corn would surely offer a hope of relief.

Corn (or cotton) fields which have been infested may be deeply winter-plowed to break up the ants' nests, the soil being deeply cultivated (or disked) before being planted to the next crop.

It stands to reason that thorough preparation of the land, liberal fertilization, and frequent cultivation will all tend either to discourage or interfere with the ants or the lice, and will encourage the crop to healthy growth which may withstand moderate attacks.

#### THE CORN BUD-WORM. (*Diabrotica 12-punctata*, Oliv.)

Order *Coloptera*. Family *Chrysomelidae*.

(Also called "Root-worm" and "Drill-worm.")

*Description*.—A slender worm or grub, half an inch long, yellowish white, destroys young corn by eating into the stalk below ground, killing the central portion. Worse on lowgrounds in cool belated seasons. The adult beetle is about one-third inch long, yellowish green with twelve black spots, feeding on many plants and often destructive on squash and related crops.

*Injury in North Carolina*.—The Corn Bud-worm is a pest of long standing in this State, so much so that a certain amount of injury by it is taken largely as a matter of course. From the very considerable number of letters which have come to us regarding it, we quote from several to show the nature of the injury as the farmer sees it:

"Have been troubled with something that kills my corn from time it comes up until 6 or 8 inches high; looks like a worm had cut the heart of the corn under the ground near the root; the heart dies and the stalk is worthless."

"Corn Bud-worms are the worst insect I have to contend with. On low bottom-lands they kill about one-half of it in cool spells. They work about an inch from the grain of corn."

"A great deal of my corn is killed by Bud-worms when about a hand high."

In June, 1907, I was told that it was unusually destructive that year in Henderson County, and that it is regularly worse in wet, cool seasons.

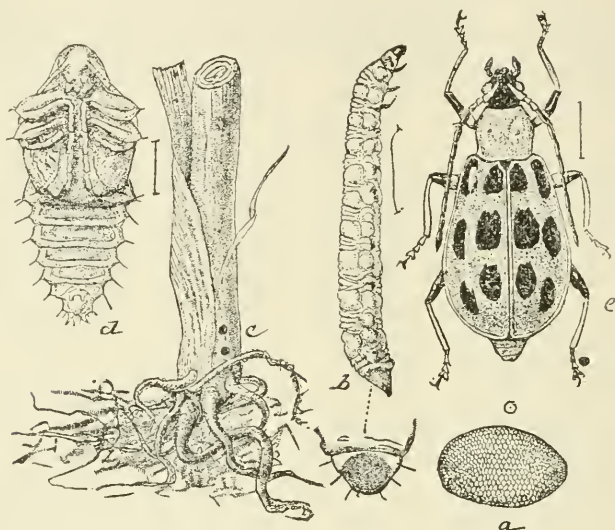


FIG. 5.—The Corn Bud-worm, showing adult beetle (e), larva (b), pupa (d), and egg (a), all enlarged; natural sizes indicated by lines, etc., at side. Work on corn shown natural size at c.  
(Redrawn from Riley, Div. Ent., U. S. Dept. Agr.)

*Field Notes on the Adults.*—Our own notes throw some light on the habits and behavior of the adult beetles.

*Hibernation.*—The winter is passed in the adult stage, presumably under any adequate shelter. In December, 1906, I found many sluggish adults inside of cracked gourds in a field in Brunswick County, and this may be a common place for hibernation. On October 31, 1900, at Raleigh, I found many eating *into and inside of* gourds which were green, but the vines of which were dead. But I *believe* that many (perhaps most) of them pass the winter under rubbish or trash.

*Emergence in Spring.*—March 10, 1904, I found adults common in blooming strawberry fields in Pender County. By March 25, same year, had noted them feeding on opening leaf-buds and flowers of fruit trees at both Southern Pines and Raleigh. In 1907 I noticed first adults in flight at Raleigh on March 22. In 1908, on March 25, adults were plentiful at Raleigh feeding on many kinds of new vegetation. In 1909, April 16, at Louisburg, Franklin County, I found them abundant on young pear foliage, many females heavy with eggs; though an assistant noted adults mating freely as late as May 17 in 1907, at Raleigh. In 1913 I saw the first active adult in garden at Raleigh on March 29.

*Later Habits of Adults.*—In October, 1900, I noted that adults were common on goldenrod and aster. On May 17, 1907, Mr. R. S. Wog-

lum, assistant, noted them abundant on squash at Raleigh, as many as 25 on one leaf, and mating was common. At Andrews, Cherokee County, on May 20, 1911, I found adults plentiful on cabbage in garden, and indicated their presence on beans. As a matter of fact, the adults feed freely on leaves and flowers of many plants, and are not confined to any particular kinds.

*Life-history.*—Prof. F. M. Webster<sup>1</sup> has recently published an account of this pest, in which he has brought together the observations of many workers, and concludes that “from all available information it appears that the egg period varies greatly and may require from 7 to 24 days, the larval (worm) period 15 to 35 days, and that of the pupa (between the worm and the adult beetle) from 7 to 13 days.”

Dr. Chittenden<sup>2</sup> records one individual adult beetle as having laid 209 eggs, though this is probably above the average, and he concludes that there are three broods at Washington, and possibly four further south.

Briefly stated, the general life-history of the insect seems to be about as follows: The adults pass the winter, emerge very early in spring, feeding on flowers and foliage, mate, and lay eggs at the base of corn or other plants in which the worms feed; the worms on hatching from the eggs, burrow into the root or stalk of the plant attacked, become grown in a few weeks, leave the plant and change to the pupa state in the earth close by, from which the beetles emerge one to two weeks later. Several broods are produced in the course of the season.

Two farmers in North Carolina, Dr. Porter of Pender County and Mr. James Middleton of Wake, placed jars over infested corn plants and thus bred the adult beetles.

#### REMEDIES.

The *time of planting* appears to be the greatest factor in preventing Corn Bud-worm. The complaints quoted show it to be worse early in the season, or in cool spells of early spring; hence the general later planting of corn would suggest itself.

In South Carolina Mr. W. A. Thomas<sup>3</sup> divides his State into three general regions corresponding to our (1) coastal plain, (2) lower piedmont, and (3) upper piedmont, and concludes (in *South Carolina*, be it remembered) that in the first or eastern of these divisions corn planted after May 5th will escape the worst of the injury; in the second or middle region, after May 12th, while in the west, after May 19th. For our own State, we should be inclined to make all the dates from one to two weeks later to allow for difference in latitude and elevation.

But the experience and testimony of farmers themselves cannot be wholly disregarded, at least not unless the most exact and definite evi-

<sup>1</sup>Bul. No. 5, U. S. Dept. Agr., Sept. 27, 1913, “Southern Corn Root-worm or Bud-worm.” F. M. Webster.

<sup>2</sup>Cir. 59, Bur. Ent., U. S. Dept. Agr., “Corn Root-worms.” F. H. Chittenden, March, 1905.

<sup>3</sup>Bul. 161, S. C. Exp. Sta., “The Bud-worm of Corn.” W. A. Thomas, March, 1912.

dence to the contrary can be produced; and in North Carolina many farmers insist that they can escape the bulk of Bud-worm injury to their corn by *either* very early, or late, planting.<sup>1</sup> An intelligent farmer in Yadkin County at the Farmers' Institute in August, 1908, said that with him corn planted in either April or June was not much hurt by Bud-worms, but if planted in May, it was hurt. His testimony is typical of that offered by many others, though somewhat more explicit.

If one's experience shows that *either* early or late planting will escape bud-worm injury, then we would incline to give the late planting the preference, as it will have the tendency to avoid other pests (cut-worms, stalk-borers), and also allows opportunity for better preliminary preparation of the ground.

It has been noted that Bud-worm is worse on lowlands, hence the use of other lands for corn when entirely available and convenient, will help to avoid injury.

As with many other corn pests, ample cultivation and liberal fertilization will enable the corn to recover from slight attacks. Also the planting of liberal amount of seed will provide enough plants for a "stand," even though some is killed by Bud-worm.

#### THE CORN BILL-BEETLE.

Order *Coleoptera*. Family *Calandridæ*.

(Also called "Bill-bug," "Klew-bug," "Curlew-bug," etc.)

*Description.*—A grayish to blackish hard-shell beetle about  $\frac{1}{2}$  inch long, with strong down-curved beak or snout; damages corn by puncturing the stalks near the ground.

This is one of the worst corn pests in the eastern part of the State. Many points in regard to its life-history, habits, and methods of control are not yet entirely clear; and as it is now under special investigation by Prof. Z. P. Metcalf of our Experiment Station, it is considered best to omit any effort at detailed discussion.

#### THE CORN-ROOT WEB-WORM. (*Crambus caliginocellus*, Clem.)

Order *Lepidoptera*. Family *Pyralidæ*.

*Description.*—Whitish caterpillars with small black spots on body, attaining length of  $\frac{1}{2}$  to  $\frac{3}{4}$  inch; attacking young corn near the ground; each caterpillar surrounding itself with a slight web.

*Injury in North Carolina.*—Only a few complaints have come to us regarding this insect, and we shall devote but little space to it. Yet we feel sure that in the total it must do considerable injury, for the adult moths are very common in grassy fields at Raleigh in summer and the insect is of wide distribution.

<sup>1</sup>The idea of early planting to escape bud-worm also exists in Alabama. Cir. No. 8, Ala. Exp. Sta., March, 1911, "Bud-worms in Corn," by W. F. Turner, p. 6.

*Life-history and Habits.*—The adult insect is a delicate little moth of silvery-gray color, which frequents grassy fields, where the eggs are laid in summer and fall. The larvæ normally live upon grasses, eating into the stems or bulbous roots at the surface of the ground. When corn is planted on land just from sod the larvæ are often already present in great numbers, and being deprived of their natural food of grasses, they attack the corn, eating into the stalk at the surface of the ground, each larva being somewhat protected by a loose web which acts as a barrier to predaceous enemies and parasites. When grown the larva is about three-quarters of an inch in length, yellowish-white, pinkish, reddish, or even of a reddish-brown color, being quite variable. In midsummer they change to the pupa state at or close to the base of the plant, and emerge as moths two weeks later. Eggs are at once laid in grass lands, where the partly grown larvæ pass the winter and are ready to commence feeding as soon as spring opens.

#### REMEDIES.

By avoiding corn immediately after sod much of the injury by this insect will be averted. If sod land is to be planted in corn, fall plowing will kill many of these insects by exposure or starvation.

#### THE LARGER CORN STALK-BORER. (*Diatraea saccharalis*, Fab.)

Order *Lepidoptera*. Family *Pyralidæ*.

(Sometimes called "Shatter-worm.")

*Description.*—Whitish caterpillars with brown or black specks, reaching length of about 1 inch, injuring corn by boring into the stalk and (when corn is young) into the terminal growing part, causing weakness and distorted growth, rendering the plant worthless when the attack is severe. Injury becomes evident in June. The adult moth measures about an inch from tip to tip of wings, is yellowish-brown, and is an active flier.

*Injury in North Carolina.*—This is a prevalent pest in this State and at times very destructive. While most of the complaints have come from the southern and southeastern counties, we believe it to be present throughout the State, at least east of the mountains. We have reports of it from the following widely separated counties, as well as many others: Alamance, Columbus, Duplin, Edgecombe, Mecklenburg, Rutherford, and Warren. It is considered to be rather a southern insect, and is a standard pest of sugar-cane in Louisiana.

At Red Springs, Robeson County, in 1902, the writer found it abundant and destructive, as many as six of the worms being taken from a single stalk, and from 10 to 15 per cent of the stalks were ruined. At Raleigh, in July, 1913, I found much injury by it in a garden, the worms even working in the tops which were bunched for tassel; in the stalks



FIG. 6.—Work of the larger Corn Stalk-borer. *a*, appearance of young stalk badly injured. *b*, stalk cut open near root to show burrow and pupa inside. (After Howard, Div. of Ent., U. S. Dept. Agr.)

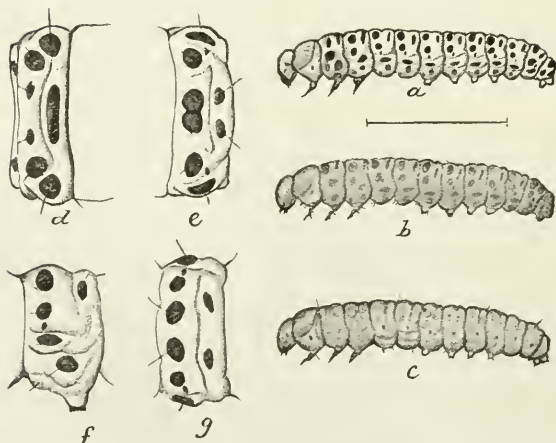


FIG. 7.—Showing larva of larger Corn Stalk-borer. *a*, *b* and *c* showing variations in the markings, etc. Natural length indicated by line below *a*. *d*, *e*, *f* and *g*, views of certain parts of body of larva.

(After Howard, Div. of Ent., U. S. Dept. Agr.)

they were present above where the ear would be. As a rule, it works in the lower part of the stalk (especially later in the season) and often close to the ground. In Mecklenburg County it was reported as having destroyed a very serious per cent of the stalks in 1913.

*Life-history.*—As an enemy of corn, studies of this pest have been published by both Dr. L. O. Howard<sup>1</sup> and George C. Ainslie<sup>2</sup> of Washington, and by Prof. R. I. Smith,<sup>3</sup> formerly of the North Carolina Station. Two distinct broods are recognized. The winter is passed in the caterpillar stage below the ground level in the stalks or roots of corn, perhaps also in some other plants. In spring the caterpillars change to the pupa state, from which the adult moths emerge after about two weeks. These moths then lay eggs on the young corn and these hatch into the first destructive worms of the season, boring into the stalks and tops of the growing corn, their injuries becoming noticeable from June 10 to 20, at which time the worms are growing rapidly and

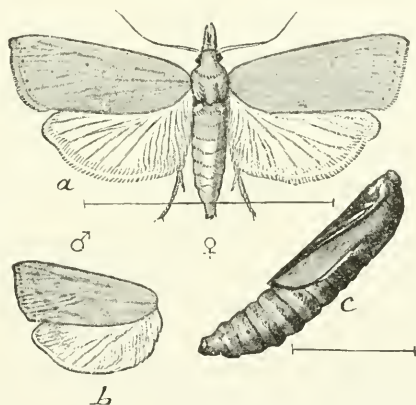


FIG. 8.—Pupa and adult of larger Corn Stalk-borer. *a*, adult moth. *b*, showing wings of male moth. *c*, pupa. Natural size of moth and pupa indicated by lines.

(After Howard, Div. of Ent., U. S. Dept. Agr.)

boring actively in the stalks. In Robeson County (1902) we found grown worms and others that had changed to pupæ on June 30th, and from these we reared adult moths July 8th. The first brood of moths, therefore, appeared that year to emerge first half of July, though two years later we received larvæ from Mecklenburg County on July 2d; so in the higher and cooler sections they are probably always somewhat later in reaching maturity. The second brood of worms burrow into the stalks chiefly in the first two joints above ground, and often so weaken them that they are blown to the ground. The worms of this second generation become grown by harvest, burrow down the center of the stalks

<sup>1</sup>Cir. 16, second series, Div. Ent., U. S. Dept. Agr., "Larger Corn Stalk-borer." L. O. Howard, Aug., 1896.

<sup>2</sup>Cir. 116, second series, Bur. Ent., U. S. Dept. Agr., "Larger Corn Stalk-borer." George N. Ainslie, Feb., 1910.

<sup>3</sup>Bul. 197, N. C. Exp. Sta., "Insects of Garden Crops." R. I. Smith, May, 1908, p. 35.

to the root, and there pass the winter in the full-grown condition, changing to pupæ in the spring, from which the moths emerge to lay eggs for the destructive spring brood of worms.

It must be remembered that no exact dates can be set for the times at which moths will emerge, or eggs be laid, for these will vary with the season and elevation. Thus at Raleigh, in 1913, we found larvæ abundant in cornstalks July 1st, and in 1905 we found pupæ July 15th in stalks from Johnston County, though in 1902 we bred adult moths July 8th. But it seems fairly well established that normally there are two full broods each season. It is quite likely that some of the worms of the second brood feed on other plants than corn—indeed, in addition to corn and cane, Ainslie says that it has been reported on sorghum, Johnson grass, guinea-corn, and gama grass.

If each worm simply burrowed once into the stalks and remained inside, the case might not be so serious; but they have the destructive habit of leaving and reëntering the stalk again, so that each worm may make several holes.

#### REMEDIES.

Thorough destruction of stalks which have been rendered useless, remnants, and stubble, would seem to be the most likely method of control. If infested stalks be cut close to the ground while borers are still in them, and fed green, many of the borers will inevitably be destroyed. If the stalks are left standing until the usual time of harvest, and are then cut *close to the ground* and shredded or made into ensilage, it is to be presumed that some of the second brood will be destroyed. Those left in the stubble can then be reached by plowing out the stubble, raking together and burning. Through the early part of the season (up to about July 1st) stalks which have already been rendered worthless should be pulled and fed green as fast as they are seen to destroy the worms in them, for they have no future value anyway. Our common custom of "pulling" the fodder and allowing the stalks to stand is favorable to this insect. But if the fodder is to be "pulled," and it is desired to allow the stalks to rot in the field, then if they be plowed under as deeply as possible the adult moths would have difficulty in emerging.

Next to the destroying of the Borers themselves in the stalks, the later average planting seems to offer the best hope of escape. The data already given indicate that corn planted reasonably late will largely escape injury by the first brood, though it will be exposed to the second brood. Dr. Howard presents results noted in 1891 (in Virginia?), from which the following is given:

<i>Date of Planting.</i>	<i>Per Cent of Damaged Stalks.</i>
April 1 to 15.....	25
April 15 to 28.....	20
May 1 to 15.....	15
May 15 to 31.....	12
June 1 to 15.....	8, or less.

Mr. Ainslie also recommends rotation as one of the best preventive measures, and says: "Where corn has followed itself on the same field for two or more years there has been a much greater loss than where a change of crop is practiced, especially where stalks and stubble remain undisturbed through winter." But he also says: "By far the most effective plan is to remove the stubble from the field with a rake and burn it."

The writer believes that this Stalk-borer offers a good chance for co-operative effort, for the moths are active fliers and can readily make their way from one field to another; hence it would seem that best results would be secured by all the farmers in a locality using the same methods at the same time.

#### THE CHINCH BUG. (*Blissus leucopterus*, Say.)

Order Hemiptera. Family Lygaeidae.

*Description*.—Small bugs about one-fifth inch long, blackish with white wings, the young bugs reddish. Appear at times in great numbers in wheat, oats, corn, millet, and timothy. There are both long-winged and short-winged forms. Most destructive in our piedmont section on "poor land." Primarily a dry-weather pest.

*Injury in North Carolina*.—This insect is very irregular in its appearance as a pest. It is present every year, but only at irregular intervals does it become excessively abundant. Any pest of this character is sure to be often reported when it does appear in numbers, especially by those of the younger generation of farmers who have not become indifferent to its ravages. Farmers who have lived long in the region of Chinch-bug injury well know of their destructiveness; others may take our statement for it that when conditions favor their increase they appear by millions, sucking the sap from the plants until they dry up as if from drought or fire. At such times the destruction is often complete, every stalk being sucked to death (not eaten) by the insects. From our somewhat voluminous correspondence we quote the following as typical and enlightening:

"They came from my wheat-field and are sucking my corn to death; have covered 2 or 3 acres in ten days." (Later) "They are not doing very much while the heavy rains fall."

"I think they first appeared in oats, then destroyed sorghum-cane, now in the corn and are destroying it. They get around the stalk near the ground and on the blades and suck it to death; seem to move in a solid army. Paris-green will not kill them."

"After harvest the bugs came from the adjoining wheat-field, marched into my corn and sucked it until it died or was so dwarfed (next the wheat) that no ears could form."

"Since the wheat was cut they have gone into the corn. They cover the stalk around the roots and in a few days the stalks will die."

"They gather at the root of the corn (or) under the sheath of the blade and there suck until they ruin the whole stalk."

"They sometimes ruin our corn on the clay land. If I had a remedy would prefer to plant corn on the clay and cotton on the sandy land."

In May, 1905, a correspondent in Rockingham County wrote that he had suffered destruction to timothy by Chinch Bugs for four years in succession; but we are forced to believe that this was a very unusual experience, at least for this State.

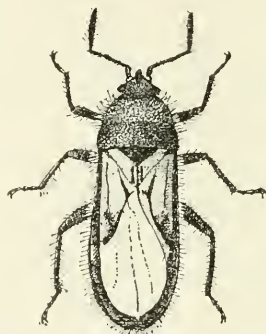


FIG. 9.—Adult Chinch Bug, showing dark color of body and white wings. Much enlarged. Insect in reality about one-fifth inch in length. This is the long-winged form of the insect.

(After Webster, Div. Ent., U. S. Dept. Agr.)

#### DISTRIBUTION, HABITS, LIFE-HISTORY.<sup>1</sup>

*Distribution.*—The Chinch Bug occurs throughout the United States east of New Mexico, Wyoming, and North Dakota (including parts of those States); also in southern and eastern Canada, eastern Mexico, in Central America and Panama; also in areas in California. It seemingly is absent in southern Florida, and occurs sparingly if at all in the higher Alleghany Mountains (statement made from Webster's Map). The area in which it is to be regarded as a pest is more restricted, embracing a large territory in what we term the "central west" (including Kansas, Iowa, Missouri, Illinois, etc.). There are spots of severe infestation in Maine, New York, Tennessee, and Louisiana. But what is of

<sup>1</sup>Among the writings on Chinch Bug, we may mention Bul. 95, Ill. Exp. Sta., by S. A. Forbes; "The 1912 Chinch Bug Campaign in Illinois," by S. A. Forbes; Bul. 69, Bur. Ent., U. S. Dept. Agr., by F. M. Webster; Cir. 113, Bur. Ent., U. S. Dept. Agr., by F. M. Webster; Bul. 191, Kan. Exp. Sta., by T. J. Headlee and J. W. McCulloch.

most concern to North Carolina farmers is the fact that a belt of badly infested territory begins in central Virginia, extends entirely across the piedmont area of North Carolina, and terminates in South Carolina. (Webster's Map).

This indication by Professor Webster is in accord with the ravages reported in North Carolina. The only strictly eastern counties from which we have had complaints are Pamlico and Gates; but in the piedmont section complaints have been numerous from Warren to Stokes counties on the north, southward to and including the counties of Wake, Lee, and Anson in the east, and Rowan, Iredell, and Gaston on the west, thus including the greater part of our "piedmont" area. The writer has, however, *collected* specimens of the bug at Beaufort on the coast; but it has not been reported as a pest there.

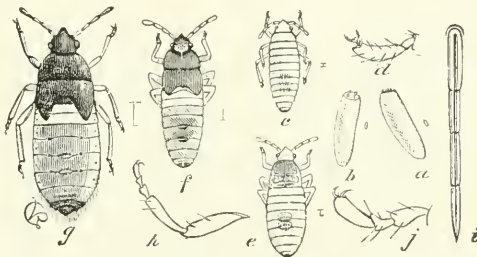


FIG. 10.—Showing various stages in growth of Chinch Bug. *a* and *b*, eggs. *c*, *e*, *f* and *g*, stages in growth of young bugs. *d*, *h* and *j*, legs. *i*, sucking beak through which the insect sucks sap from the plant. All enlarged, natural sizes indicated by lines, etc., at side of figures.

(After Riley, Div. Ent., U. S. Dept. Agr.)

*Habits and Life-history.*—Adult bugs pass the winter in grasses, under rubbish, etc. At Raleigh we have found them in winter under boards at grassy edges of fields. When spring opens these bugs take flight early and seek growing grasses or small grains which will serve as food. In 1905 (while inspecting wheat-fields for Hessian Fly with Professor Webster), it was found April 11 in Guilford County at base of wheat plants. We did not find eggs nor observe mating. On April 14 (1905) Professor Webster found one adult in wheat-field in Mecklenburg County. My notes of that trip say: "Farmers say they appear worse in spots near stumps, stones, and trash, in which, no doubt, they hibernate. Stones and trash were near where these were found." The adults which emerge in spring fly freely in search of suitable food.

Once settled in the fields of small grain (or grass), they finally lay eggs, and the young bugs which hatch feed on the growing plants. The young bug bears a general resemblance to the adult, though it is reddish and wingless (there is no worm, larva, or caterpillar stage in the

Chinch Bug). About the time of harvesting wheat and oats these young bugs mature, and they then spread to cornfields for new food, doing so mostly by *walking or crawling* instead of flying, though they have wings. Another brood of young then develop in the corn, and these, when winter approaches, seek winter quarters. There are, so far as positively known, only two complete and distinct broods, the first maturing in the small grain and the second in the corn. This fact of two distinct broods and the habit of migrating is clearly indicated in the letters of complaint which we have already quoted. But it is worthy of special emphasis that *in going from the wheat or oats to the corn, they do so chiefly by crawling (not flying)*, for on this point the protection of the corn from the bugs largely depends.

The Chinch Bug, both in young and adult, is provided with a beak attached to the head, which is thrust into the plant and through which the juices are sucked. Being thus a sap feeder, it cannot be poisoned by Paris-green, etc., which must remain only on the surface of the plant. The effect of their attack is to dry out and wilt down the plant.

There are two forms, or races, of the Chinch Bug: one having wings nearly as long as the body when adult, the other having decidedly shorter wings when adult. It is said that the short-winged form is more prone to attack grasses; while it is the long-winged form that is the chief enemy to corn.<sup>1</sup> All the adult bugs in our collection are of the long-winged form.

*Dry Weather Favors Chinch Bugs.*—Usually Chinch Bugs are more destructive in dry weather, and in wet seasons they are not so noticeable. This is apparently because of certain epidemics of disease among them which are more virulent during wet seasons. It is well for farmers to know this, as it is often convenient to be able to forecast, even though imperfectly, their probable appearance in any locality in destructive numbers. Heavy showers also drown many of them.

*Worse on Certain Lands.*—A preference for clay lands rather than sandy is indicated in the complaints already quoted, and the same or similar testimony is often offered to the writer when discussing this insect at Farmers' Institutes. We have also been assured at Institutes (humorously but seriously) that there is no better preventive for them than stable manure, as they are sure to be most destructive on the "thin, poor spots in the field," and that the farmer on thin, poor land suffers worse from them than the one on rich, strong land. In any event, we can all agree that the more vigorous and healthy the corn, the more resistant it will be to slight injuries, whether from this or any other insect.

*Natural Enemies.*—On account of a very disagreeable odor possessed by these insects, one would not expect to find many enemies which

<sup>1</sup>Cases similar to this are known in other insects. Certain grasshoppers which inhabit densely grassy places are short-winged and cannot fly, while closely related species occurring in the open have longer wings and can fly.

would devour them. Although a large number of birds doubtless eat them to a greater or less extent, the quail or common "Bobwhite" stands at the head of the list, and the blackbirds, bobolinks and sparrows follow.

But by far the most prevalent natural enemies of the Chinch Bug are certain diseases, particularly those of a fungous nature, which not infrequently save many thousands of dollars to the farmers by destroying the bugs. One of these fungous diseases, known as the Muscardine fungus, has been considerably experimented with in Kansas and some other states, to see if it could not be artificially introduced into fields where the bugs were doing injury; but it is so slow to get started, and so uncertain in its results, that it has never come into general use.

#### REMEDIES.

Out of all the mass of recommendations for the control of chinch bugs, three methods stand out as available and useful as conditions exist in this State: (1) Destruction of the bugs in their winter quarters; (2) preventing them from spreading from wheat or oats to corn by means of barriers to their progress, and (3) killing them (the young ones, at least) by spraying while they are in restricted areas, before they have spread throughout the cornfield.

*Destruction of Bugs in Winter.*—In Kansas, where the bugs seem to hibernate largely in bunch-grass, they have been successfully destroyed by burning over *closely* so as to reach those that are close down between the bases of the stems. In North Carolina we at present know of no one place in which the bugs especially congregate for winter, but have found them under rubbish in grassy places near cornfields. Hence the cleaning and burning over of such waste places, fence-rows, ditch-banks, etc., adjacent to cornfields which were infested in summer will seem likely to destroy many of the over-wintering bugs. But as the bugs are not usually serious with us two years in succession, farmers may neglect this after-measure, and may be more inclined to depend on the next method discussed, namely:

*Preventing the Spread into Corn, by Barriers.*—For this purpose, a deep furrow, a strip of plowed and finely pulverized soil, a narrow strip of tar laid in a furrow or even simply on the ground—these all serve to check the insects in their march from one field to another. If a furrow is to be used it should be deep and so run that the earth shall be thrown toward where the bugs are already congregated, so that they will have to *climb* the *steep side* of the furrow. If the insects are found in the oat stubble, for example, one or two such furrows should at once be plowed around the field to prevent their escape. Two furrows a few feet apart will of course be more effective than one.

The furrow may be made still more effective by digging holes with regular post-hole digger every 15 to 20 feet in the bottom of the furrow. The bugs falling in the furrow will run along trying to find an outlet, and presently falling in the holes, will be quite unable to escape.<sup>1</sup>

Infested stubble can be burned over, if thick and dry enough, or plowed deeply and rolled or dragged to finely pulverize the surface.

If a strip several yards wide be plowed *around* the infested oats or wheat and this be finely pulverized, the bugs will have difficulty in crossing it so long as the surface remains dry and dusty; rain will hinder its usefulness.

The use of a strip or line of tar around a field serves the same general purpose.<sup>2</sup> Two such strips a yard or two apart will be even more effective. The earth may be scraped clean along the line where the tar is to be placed, so that sticks, grass or weeds shall not serve as bridges for the insects to cross.

Where a part of the cornfield has become infested, the same methods may be employed, separating the infested from the uninfested parts of the field, so as to check their advance.

Of course, the best protection will be secured by the employment of several of these methods together.

The success of these methods is based upon the fact that the adults which mature in June *crawl* rather than *fly*, even though they do have wings. And as their legs are short and their bodies comparatively inelastic, they find it difficult to overcome obstacles such as have been mentioned; furrows, strips of tar, or finely pulverized soil making very effectual barriers to their progress. Of course, a sudden dash of rain may destroy the barriers, which must be replaced at once.

*Spraying.*—We are not advocating the spraying of whole cornfields to protect them from Chinch Bug. This spraying method is available chiefly while the bugs are only in restricted areas of the corn.

Kerosene emulsion has been recommended for this purpose by Professor Webster (1907), to be prepared as follows: Dissolve  $\frac{1}{2}$  lb. of hard soap in 1 gal. water, bring to a boil, then pour in 2 gals. kerosene and churn together vigorously until it becomes cream-like. To each gallon of this add 15 gallons of water, mixing thoroughly. He states that it is best to spray the corn with this before 8 a. m. or after 5 p. m., as it will then be less likely to hurt the plants.

But in the writer's personal experience with plant-lice he finds that ordinary grades of laundry soap dissolved in warm water is an excellent substitute for the more complicated (and more dangerous to plants) oil

<sup>1</sup>Headlee and McColloch, in Kansas, found a blast-torch preferable for destroying the bugs along the barrier.

<sup>2</sup>In Illinois, Dr. Forbes had excellent results from "Road Oil No. 7," a grade costing about \$3.50 per barrel and especially prepared for Chinch Bug work. (Standard Oil Refinery, Whiting, Ind.) In this State tar would perhaps be more available.

emulsion. And Dr. Forbes in his Chinch Bug work in 1912 found that, "Chinch Bugs were killed by the soap solution alone, with no injury to the corn, if cheap rosin soaps were used at the rate of 1 lb. to 6 gals. water."

In this State such brands as "Octagon," "New Home," and the like are everywhere in common household use, and we have controlled many plant-lice by using these brands dissolved in water at rate of 1 lb. to 4 gals. Hence we give the method by which we have prepared it, believing (without actual test against this particular pest) that it will be quite satisfactory against young Chinch Bugs:

Cut 1 lb. of soap into thin slices in 2 gals. water. Bring to boil to dissolve the soap; now pour in 2 gals. water (cold preferably), and spray while the solution is still warm.

If the cheaper grades of "rosin soap" are on hand, they may be used in same way, or, as suggested by Dr. Forbes, even at the weaker strength of 1 lb. to 6 gals. In spraying for Chinch Bugs use liberally enough to thoroughly *drench* them.

In closing this discussion of the remedial measures for the Chinch Bug, it is of interest to read the following letter from one who used the furrow method. This letter is here given because there are so many who believe that such a remedy will not prove satisfactory:

\* \* \* Will say that I first had deep furrows, throwing the dirt from the corn and then bedded back to the corn. In this way the bugs were held in check, and destroyed only ten or twelve rows that they first appeared in. Thanking you for your prompt reply, I am,

Very truly,

W. N. BOYD.

Warrenton, Warren County, N. C., October 19, 1904.

### ARMY WORMS—TWO KINDS.

Order *Lepidoptera*. Family *Noctuidæ*.

There are two distinct, though closely related, species of corn insects which when abundant are commonly called "Army-worms." The adults of both are moths and they belong to the same family (*Noctuidæ*), which family also contains the cut-worm and ear-worm moths, discussed in this BULLETIN.

As the life-histories of these two insects differ, we discuss each separately. The one which normally is destructive earlier in the season is the true "Army-worm"; the other which is destructive later is distinguished by the name of the "Fall Army-worm."

#### THE ARMY-WORM. (*Heliothrips unipuncta*, Haw.)

*Description*.—The grown caterpillars are about 1½ inches long, of a dark gray or blackish color with three narrow yellowish stripes above

and a darker and broader one on each side, appearing at times in hordes of countless thousands, devouring vegetation of various kinds, but especially grains and grasses. The adult moths spread about  $1\frac{1}{2}$  inches from tip to tip of the wings and are brownish-yellow in color.

*Injury in North Carolina.*—Very few outbreaks of this insect have been reported to us, although it is certainly present in at least limited numbers every year. Adult moths are often found at Raleigh from May to November. We have one adult moth captured by the writer at Hendersonville in June, 1907. The indications are that it occurs throughout the State, but that its area of destructiveness is chiefly in the western half.

In 1907, three complaints of damage by it were received from the mountains, but in no case was the outbreak reported as widespread. The complaints were all in May.

In August, 1908, while the writer was in the western part of the State on Institute work, news of an "Army-worm" outbreak came from Durham, N. C., and this was looked into by Assistant Z. P. Metcalf, some of whose observations will be presented later in this account.

*Life-history, Habits, etc.*—There are undoubtedly several broods of this insect each year, for at Raleigh the moths have been collected from May to November by Mr.



FIG. 11.—Army-worm (larva) on head of timothy. Natural size.

(After Comstock, Div. Ent., U. S. Dept. Agr.)

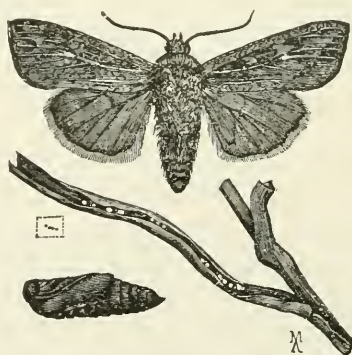


FIG. 12.—Army-worm moth, pupa and eggs on grass stem. Natural size.

(After Comstock, Div. Ent., U. S. Dept. Agr.)

C. S. Brimley. Dr. Forbes<sup>1</sup> states that only one brood is apt to be destructive in any one locality in any one year. This agrees with the reports which have come to us; and observations in 1908 indicate that there is a good reason. It is believed that the winter is spent in the

<sup>1</sup>An excellent account which I have consulted in this connection is given by Dr. S. A. Forbes in Bul. 95, Ill. Exp. Sta. Some of the statements are also based on a Bulletin of the N. Y. (Cornell) Exp. Sta., by M. V. Slingerland.

adult moth state, the moths laying eggs in early spring in grassy places, each female moth being capable of laying several hundred eggs. The worms which hatch from these feed on grasses, and when the supply is exhausted may march in an "army" into corn or other grain. They feed eagerly, grow rapidly, and finally enter the earth to change to the pupa stage, from which adult moths emerge in two weeks, and these, after mating, lay eggs for another brood.

When searching for new food they often move in a solid army containing countless thousands of individual worms, and devour all suitable food as they go. The records that we have for this State indicate that they have destroyed corn, grasses, and timothy; but wheat, oats, millet, etc., are also relished. Their preference seems to be for the grass-like plants; but in absence of these, they may be induced by hunger to take others.

*Natural Enemies.*—Fortunately, this Army-worm seems especially susceptible to subjection by its natural enemies, among which the most important seems to be a parasitic fly (*Winthemia 4-pustulata*, Fab. Order *Diptera*). This fly is somewhat larger than a house-fly and more bristly. It lays its eggs on the skin of the Army-worm and the fly-maggots hatching from these eggs eat into the body of the worm, usually causing its death before it can reach the adult moth stage to perpetuate another brood.

Mr. Z. P. Metcalf, at that time assistant in this office, made observations on the activity and efficiency of these parasites during the Army-worm outbreak at Durham in August, 1908. Out of 491 worms which Mr. Metcalf brought back and confined in cages, 442 were infested with eggs of this parasite, leaving 49 without parasites,—yet 61 of the worms developed to the pupa, but only 7 yielded adult moths. In a few cases he found that where only a single egg had been fastened to the worm, that it was able to complete its changes and emerge as an adult moth. But the fact of only 7 moths developing from 491 worms indicates that over 98 per cent of the worms died before reaching maturity, while from these same 491 worms he reared 556 adults of the fly-parasite. His data showed that while many of the parasites also died before they matured, that the *rate of mortality* with the Army-worm was over 98 per cent, while for the parasite it was 73 per cent. This difference would undoubtedly be much greater could the rate have been calculated from *egg to adult* in both cases; but this was impossible. But these results show that the tendency would be for the flies to rapidly overtake the worms in number, and subdue them; and this, no doubt, in large measure explains why the Army-worm is not more often destructive, and why it is that usually only one destructive brood shows up in a locality in any one season.

## REMEDIES.

The remedies for this Army-worm are much the same as for the Fall Army-worm next discussed, hence will be considered in that connection. (See page 40.)

**THE FALL ARMY-WORM.** (*Laphygma frugiperda*, S. & A.)

*Description.*—Grown caterpillars are from 1 inch to 1½ inches long; along each side a black stripe and in middle a wider yellow-gray stripe which includes four black dots on each body segment. Sometimes occurring in great numbers together, in late summer, though often more scattering; feed on great variety of plants. The adult moth spreads about 1 inch from tip to tip, front wings mottled grayish-brown, hind wings pinkish white, almost transparent.

*Injury in North Carolina.*—In 1899 (before the writer was engaged in work in the State) this species was destructive in the southeastern part, being reported to the U. S. Department of Agriculture from several localities.

In 1902 (August 23) it was reported from Duplin County, and as the letter well illustrates the work of the species, we quote:

“Crab-grass came up all between the peas and the outlook for a fine crop of hay was very good, but two or three weeks ago a small striped worm appeared and has literally stripped the grass, leaving stems only; are beginning to cut the peas; they are here by millions.”

But during the present century, at least, there has been no year in which the area and severity of its ravages could compare with that of 1912, when it was indeed a severe scourge in many localities in our State.

*Outbreak of 1912.*—The first positive report of Fall Army-worm in 1912 came July 20, from Chadbourn, Columbus County, where it was reported as eating young corn. The last complaint was October 26, from Pilot Mountain, Surry County, where it was attacking rye. The complaints were, however, divided approximately into three series, which we believe did actually indicate three successive destructive broods of the worms. The first series of complaints covered the period from July 20 to August 3. The second series began August 17 and ended August 26. The third series of complaints opened September 25 and closed October 26. There were no complaints *dated* between August 3 and 17, nor between August 26 and September 25. The last series contained only three complaints (September 25, 27, and October 25), of which the last might possibly represent a fourth destructive generation of worms, though probably not.

Many of the complaints indicated no particular crop, but among the crops which were definitely reported as suffering were corn, grass, soy

beans, peanuts, peas, alfalfa, rye, cane, potatoes (kind not specified), and cotton. But the cotton farmer who reads this account should bear in mind that this Fall Army-worm is *not the same* as the cotton caterpillar which stripped cotton throughout the State in 1911.

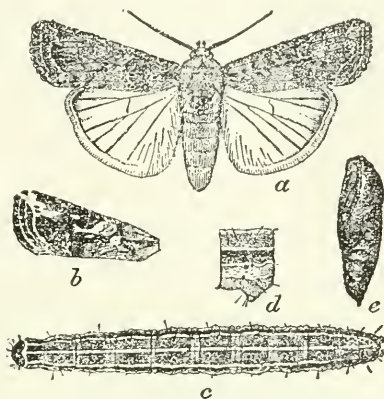


FIG. 13.—Fall Army-worm. *a*, adult moth; *b*, wing, showing variation in markings; *c*, larva or "Fall Army-worm"; *d*, part of body of worm, from side; *e*, pupa.  
*d* is twice natural size; others one-fourth larger than natural size.

(After Chittenden, Bur. Ent., U. S. Dept. Agr.)

While the injury and complaint regarding Fall Army-worm was especially severe in 1912, it is interesting to know that the insect is really common with us every year, though only occasionally do the caterpillars appear in such destructive hordes. Thus, in 1906 we have undoubted evidence that the insect was abundant, though no complaint of it reached us. In that year Mr. C. S. Brimley of Raleigh, an insect collector, was collecting moths by attracting them to trees on which a sugar mixture had been smeared. He noted that the adult moths of this Fall Army-worm were very abundant, counting "about 600 of these moths on five sugared trees on August 23, and they were present in same numbers the next two nights. The same five trees were visited by about 300 moths on the night of October 3." Mr. Brimley records the occurrence of the moths at Raleigh from late July to early November.<sup>1</sup> These observations and notes were made and published by Mr. Brimley over three years before the outbreak of 1912. I present this data here as proof to our farmers that the severe outbreak of 1912 was not by a "new insect," but by one which is present every year, and similar outbreaks may occur any year when conditions are suited to the insect. Yet the moths are free fliers and may wander or migrate for some distance before laying eggs, so that a brood of worms in one locality may yield moths which will produce another brood of worms in some other locality. Study of the distribution of complaints received in 1912, in connection with the dates, might indicate this, but we will not take the space.

<sup>1</sup>Entomological News, Jan., 1909, p. 35.

*Life-history.*—Briefly put, the life-history seems to be about as follows: The winter is believed to be passed mainly in the pupa stage an inch or two below the surface of the ground. Moths emerging from these in spring or early summer lay eggs from which a brood of worms hatch. These, when grown, go underground and change to pupæ, from which another brood of moths emerges later. How many distinct broods may thus be produced we do not know, but as the worms feed ravenously and grow rapidly, there are certainly several broods, the later broods (July to October—our records) being more likely to be destructive.

#### REMEDIES.

The outbreak of 1912 extended through many of the southern states and called forth a special appropriation and special investigation by the U. S. Department of Agriculture. In August, 1912, the U. S. Department issued Circular No. 40 (revised), upon which this account of remedies is based.

*Poisoning the Worms.*—In making applications of poison to kill the worms, it must be remembered that the vegetation which is so treated is not to be used as forage. Hence this method is more applicable to waste places, or in the edges of cornfields rather than wholesale over entire forage crops. Paris-green or arsenate of lead may be used, either as a dust application or in water as a spray. As Paris-green is better known and more available, we discuss it first, although the arsenate is considered to be really more effective.

*Paris-green, Dry.*—Mix Paris-green with lime or flour at rate of 1 lb. to 4 lbs. of lime or flour. The worms eat it more readily if mixed with flour, but it is less likely to hurt leaves if mixed with lime. Take your choice. Dust the plants until whitened.

*Paris-green, Spray.*—Mix Paris-green with water at rate of 10 ounces to 50 gallons, adding 2 lbs. of freshly slaked lime. Spray liberally, endeavoring to reach all the leaves or blades of the plants treated.

*Arsenate of Lead, Dry.*—This material is more commonly sold in paste form, but the dry powdered form can be ordered, and is considered better than Paris-green because it can be dusted on pure without injury to the leaves. It will be cheaper to mix it with equal or twice its weight of flour.

*Arsenate of Lead, Spray.*—If the powdered form is to be used as a spray, mix with water at rate of 2 lbs. to 50 gals. water. If the paste form is to be used, use 4 lbs. to 50 gals. water; spray thoroughly.

*Poison Bait.*—This method gives a chance to poison the worms without applying it to plants at all, so the plants can be used as forage afterwards. Mix 2 to 3 lbs. of either Paris-green or (powdered) arsenate of lead with 100 lbs. wheat bran. Add 2 gals. syrup, and water enough to moisten; mix thoroughly, and distribute on ground where worms are.

*Barriers.*—If a deep furrow be plowed ahead of the moving worms, or around fields to be protected, or around the area where the worms are, so as to confine them, they find it somewhat difficult to cross the obstruction. In all cases list *toward* the worms, so they will have to climb the *steep side* of the furrow. If it is desirable or seems necessary to destroy them as they gather in the furrow, a log may be dragged along in the furrow from time to time, or they may be killed by application of kerosene or a blast-torch, or occasional post-holes in bottom of the furrow will concentrate many where they may be crushed.

*Cultivation.*—As the worms go underground only an inch or so to change to the pupa stage, many of them may be killed or at least disturbed in this process by thorough shallow cultivation, or disking the land where a brood of worms *has matured and just disappeared*. This would need to be done soon after the worms enter the earth, for in the course of a week or two they will have issued as moths, and then the work would be absolutely useless.

When Army-worms have developed in large number, and especially when they begin to move from one field to another, they require immediate and thorough action. It may require the labor of every available hand for a day or two to keep them in check; but fortunately the duration of each brood is short, and much depends upon detecting the trouble *early* before the worms are widespread, and taking prompt action *then*. While we have discussed the remedies for both kinds together, it is to be remembered that there are two distinct Army-worms which may attack corn, the "Army-worm" being more in the western part of the State, more confined to grasses and grains, and more apt to remain in dense "armies." The Fall Army-worm is more prevalent (according to present evidence) in the eastern and southern parts of the State, feeds on a greater variety of crops, and is more inclined to scatter instead of remaining in compact swarms.

#### THE SUGAR-CANE BEETLE. (*Ligyrus rugiceps*, Lec.)

Order *Coleoptera*. Family *Scarabæidæ*.

*Description.*—A pitch-black beetle about one-half inch long, of somewhat the shape of our green "June Bug"; attacking corn at or about the surface of the ground, eating into the stalks.

*Injury in North Carolina.*—Records of the U. S. Department of Agriculture at Washington show that in June, 1885, this insect was reported from Monroe, Union County, with the statement that it was new to the farmers there.

On May 30, 1904, Dr. E. S. Credle, Pantego, Beaufort County, made complaint of this pest. As our correspondence at that time covered most of what is (even now) known of the insect in this State, it is given in some detail. His first letter was as follows:

4—May

I send you under separate cover a bottle of bugs that are destroying the corn crop in this township. Please let me know what they are and if there is any remedy for them.

## REPLY.

\* \* \* It is the Sugar-cane Beetle, which is regularly destructive in Louisiana, but of which I have never had any complaint during the four years I have been in this State. As its name indicates, it is known primarily as a pest of the sugar-cane. \* \* \* A most careful search of the literature fails to reveal any reference to remedies which have been found effectual, and I guess we must put it among those (pests) against which we have little or no means of defense. It has been suggested that the beetles are attracted to lights, and I would suggest that you hang a brightly burning lantern in your cornfield suspended over a pan in which is tar, or water and kerosene.

\* \* \* Now this will be an experiment merely. I am not even sure that it will attract a single one of the insects, but I think that the test will be well worth making. \* \* \* Please also try to give me some information on the following points: (1) How many years have you known this pest? (2) How long has it been with you this season? (3) Where and how does it attack the plant (living specimens with plant would furnish best answer)? (4) How abundant is it in the fields—how many at each hill on an average?

\* \* \* Any observations that you can make, or specimens that you can obtain, bearing on the life-history or habits of the insect will be of interest and value. (June 4, 1904.)

Dr. Credle's next letter was dated June 9, 1904, and was as follows:

\* \* \* I have tried the lantern and water and kerosene, also the tar, but had no success; did not get a dozen bugs in three nights. These bugs first appeared here last year about the middle of May, and after the first big rain we had they disappeared. They returned this season, first of April, and are here yet and very numerous, from eight to ten to the hill of corn. I send you, under separate cover, bugs with a sample of the different sizes of corn and cotton that they are at work on. \* \* \* You will notice they do their work right at the root, and they can kill corn any size. The outlook is that they are going to be the most destructive pest that we have ever had. Hope there may be some way to destroy them.

## REPLY.

\* \* \* I would like to make a few other suggestions as to remedies, and if you find it convenient to try them I hope you will report results: (1) the sprinkling of a little wood-ashes about the base of the plants, say a handful to each hill; (2) same, using air-slacked lime; (3) pine sawdust, which should be fresh enough to have a strong tar or pitch odor. If you try any of these methods I would advise that you use them only on a small scale, as it will likely prove useless in any case, and it would scarcely be advisable for you to go to any great trouble in a mere experiment. (June 11, 1904.)

Dr. Credle's next letter is dated June 14, 1904, and from it the following is taken:

\* \* \* I am still of the impression that they are dry-weather bugs. The part of the township (where) they are doing the worst damage there has been no rain since March. There has not been enough rain since the first

of April to lay the dust, but I have noticed for the last few days they (the bugs) are dying; can see them all about in the field dead. Will try the remedies you suggest and report.

On June 6, 1905 (a year later), Dr. Credle wrote:

\* \* \* My corn crop last year was so completely destroyed by the beetles that I had what was left plowed up the first of June and planted over on the 7th and 8th. This last crop was not bothered in the least by them, and I made a good crop. They have been there all winter. When the corn was being housed in December we would often find them under the shuck, eating the corn. \* \* \* They have destroyed corn for me this season, but not so bad as last. The only places they bothered this year to any amount was where I raised hay last year. But they have stopped now, and I don't think they will bother further this season. Several of my neighbors have had to plow up and plant over this season, that were bothered very little last year. I did not use any of the remedies, as I did not have any cause to do so in the last planting. Did not make any observation on the egg-laying habits, but as they seem to bother more where that old dead grass was plowed in, that must have been the place where they laid (very likely!). I am satisfied that they do but little damage after June 1st.

Dr. Credle also stated that the insects seemed very fond of Irish potatoes, and that while breaking ground they often found them eating the volunteer potatoes in the spring.

Mr. J. P. Clark, of Pantego, also wrote (June 2) in 1905, stating that farmers were again troubled with this Cane-beetle; that some of the land had to be plowed and replanted.

This time we were able to make some observations in the field. Mr. G. M. Bentley (at that time assistant) was sent to Pantego to examine the conditions. His observations are dated June 14, 1905. The first field examined had been much damaged and replanted, the corn then being nearly 6 feet high; only a few of the beetles were found, and injury was not much in evidence. In the second field the corn had been planted for the third time of the season and was smaller; a considerable number of the beetles were found eating the young stalks. The third field examined was that of Dr. Credle, from whom we have already quoted. A number of beetles were found (after careful search), as many as five on one stalk, working at, or just beneath, the surface of the ground. Observations in different parts of the field showed that "noticeably more beetles were at work in a certain portion of the field where 'bull-grass' had been plowed in. The beetles were found mating in several instances." Specimens sent by Dr. Credle, June 9, 1904, were mating in box when received.

Since the outbreak of 1904 and 1905 in Beaufort County we have had only one complaint, this coming in June, 1912, from Greenville, Pitt County; but there was no indication that the damage was widespread or long continued.

DISCUSSION OF THE INSECT.<sup>1</sup>

FIG. 14.—Sugar-cane Beetles. A row of the adult insects, natural size. See also figure on front cover of this Bulletin (original).

The complete life-history of this insect does not appear to be known, the laying of the eggs, appearance of grown larvæ, and methods of pupation, all being unsettled points. Most of the observations that have been made on the insect have been made in Louisiana and Mississippi, and here the habits and life-history might be slightly different. If the larva lives on the roots of the sugar-cane in Louisiana, it may live on roots of grasses, as Dr. Credle intimates, or sorghum-cane, some species of wild reed or rush, or perhaps on corn itself, in this State. As to its being primarily a dry-weather insect, as intimated by Dr. Credle, the natural habitat of the insect in the low cane-lands of Louisiana would seem to show that if anything it should prefer a damp climate. Observations made in Mississippi seemed to show it to be worse in wet lands, and this would seem to be a natural occurrence. In June, 1886, Mr. G. W. Smith-Vaniz, of Canton, Miss., in writing to the U. S. Department of Agriculture at Washington, sent eggs found in soil near corn where the beetles were at work, and which were similar to eggs dissected from the bodies of female beetles. Mr. Smith-Vaniz also hatched out young larvæ; but there the observations seem to cease.

We have in our collection one specimen of the adult beetle which was taken at Gastonia, Gaston County, on May 30, 1902.

As to the possibilities of this insect becoming a regular and serious corn pest in this State, it seems reasonable to infer that its injuries will probably be confined chiefly to the eastern part of the State, in what is commonly known as the coastal region, and its outbreaks, however serious at times, will probably be of irregular and infrequent occurrence. How long it has already been in the State no one can tell with certainty. The injury to cotton and potatoes, as reported by Dr. Credle, is probably unusual and occurs only when the beetles are exceedingly abundant.

## REMEDIES.

Late planting, liberal fertilization, and cultivation are the only palliatives that we can suggest which are at all certain to yield results. It is

<sup>1</sup>An article on this insect from which this account is largely drawn (other than our own notes and observations) was published by Dr. L. O. Howard, U. S. Entomologist, in *Insect Life*, Vol. 1, pp. 11-13, 1889.

to be observed that corn planted June 7th and 8th, 1904, made a good crop at Pantego, and in 1905 the insects were disappearing as early as June 6th. Dr. Credle's observation of their being worse on land just from grass suggests the advisability of avoiding such lands for corn.

Although the insects seem to be attracted to lights at times, this habit does not seem to tempt them to leave the plants when feeding and cannot be relied upon to lure them to their destruction.

See Rotation (p. 6), Fertilization (p. 7), Time of Planting (p. 7), Cultivation (p. 8).

**THE CORN EAR-WORM.** (*Heliothis armigera*. Hub.)

Order *Lepidoptera*. Family *Noctuidæ*.

*Description*.—A grayish, greenish, reddish or brownish caterpillar (very variable in color), about one and a quarter inches long when grown, which eats into the ears of corn, often several in a single ear. The adult is a yellowish-brown moth with wings expanding from 1 to  $1\frac{1}{4}$  inches from tip to tip.

*Injury in North Carolina*.—Among our destructive insects we think that this stands near the head, both in the total amount of damage done and the difficulty of combating it. According as it attacks different parts of the several crops, it is known as the Cotton Boll-worm, the Tobacco Bud-worm, the Tomato Fruit-worm, the Corn "Shatter-worm" (when in the top of corn) and the Corn Ear-worm. The insect also attacks other plants to more or less extent; has been reported burrowing in the pods of cow-peas, in the seed-pods of tobacco, and others have recorded it as occasionally eating into orchard fruits, though we have not noted this. Here we are principally concerned with its injuries to corn, and in this connection the following records are of interest:

In the latter part of May and early June, 1902, complaints were received from Mr. A. T. McCallum at Red Springs and Mr. A. J. McKimmon of Maxton, both in Robeson County. In response to these complaints the writer made a visit, giving special attention to the case at Maxton, which was especially serious. Mr. McKimmon had about thirty acres planted in sweet corn for shipment to northern markets, but scarcely an ear could be found which was not infested with *several* of these larvæ. As many as eleven were found in a single ear. The crop was fully 75 per cent (if not 99 per cent) lost from the ravages of this pest.

Early in January, 1903, Mr. R. W. Livermore, also of Red Springs, wrote asking about methods of combating this pest which had done him serious injury the year previous. From his letters, dated January 6th and 8th:

\* \* \* The worm which was doing the damage in my early corn last year was the worm which bores into the ear when the corn is ripening. I am inclined to think that this worm shuts out the early sweet-corn crop for this section as a shipping crop to be depended upon.

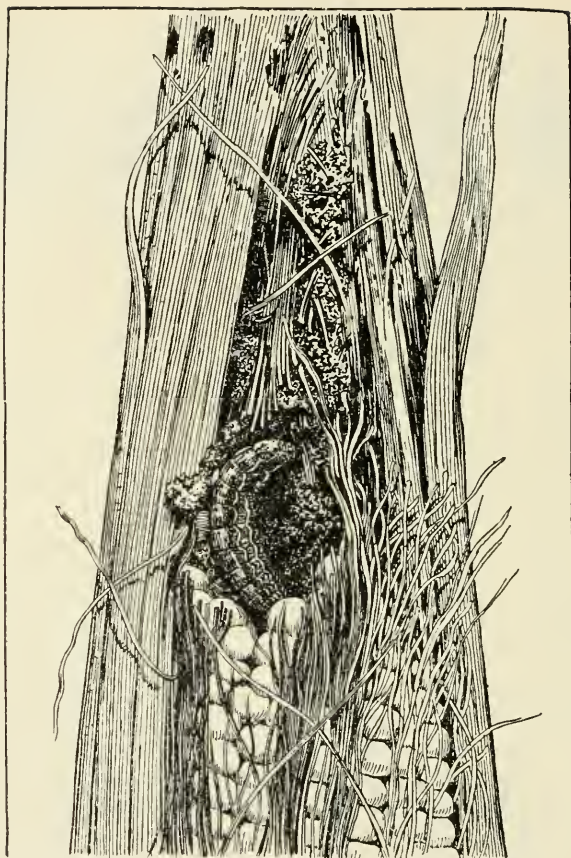


FIG. 15.—The Corn Ear-worm, showing the destructive larva at work in ear of corn.

(After Quaintance, Bureau Ent., U. S. Dept. Agr.)

*Life-history and Habits.*<sup>1</sup>—The winter is passed in the pupa stage, under the surface of the ground. The adult moths come out in spring or early summer and, being very active fliers, wander whither they will in search of nectar-bearing flowers or suitable plants upon which to place the eggs. When corn is the object of attack the eggs are laid on the silk, though the early brood of moths often deposit them in the terminal growing part of the plant, in which case the caterpillars eat the leaves and tassel and are called "Shatter-worms." The great majority of the eggs are laid on the silk, and the larvæ work down the silk, or bore directly through the husk to the forming ear, where they feed on the kernels and soon attain full growth, when they burrow out

<sup>1</sup>This portion of the account is based partially on Farmers' Bul. 191, U. S. Dept. Agr., by A. L. Quaintance.



FIG. 16.—The Corn Ear-worm, showing larva at work on blades of corn. When it does this injury it is sometimes known as the "Shatter-worm."

(After Quaintance, Bureau Ent., U. S. Dept. Agr.)

through the husk and enter the ground to pupate. There are a number of broods during the summer, the last brood passing the winter in the pupa state and emerging as adults in the spring.

Corn is not much attacked after the kernels begin to harden, the insects then turning to other plants such as tomatoes, tobacco and cotton. There are several broods each season, probably four or five in the greater part of this State.

*North Carolina Notes.*—The notes here given throw some light on the time of emergence, etc., of the insect in this State:

In 1900, on September 18th, Mr. D. L. Wolff, R. F. D. No. 1, Pinnacle, Surry County, sent in adult moths which were captured when on tobacco flowers.

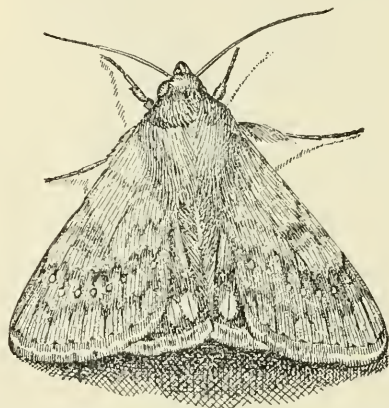


FIG. 17.—The Corn Ear-worm, showing adult moth in natural position with wings not spread. About twice natural size.

(After Quaintance, Bureau Ent., U. S. Dept. Agr.)

In 1902, at Raleigh, adults were observed for the first time in the terminal blades of corn on May 15th. On the 18th eggs were abundant on new silk (it was early corn) and thereafter larvæ were abundant in the ears.

In 1904, the writer found his first adult ear-worm moth for the season at Raleigh, on June 15, though they had likely been out some time previous. This moth was in the funnel formed by the top blades of the corn-plant which was not yet in tassel. On June 18 (same year) eggs were abundant on silk of Adams' early corn in garden, but no worms had yet appeared.

In 1905, on May 18th, Mr. S. O. Lazenby, R. F. D. No. 4, Statesville, sent in a specimen of the adult moth.

These notes show that the adults are abroad early in the spring and also late in the summer, into the fall. The finding of larvæ mature, or

nearly so, at Maxton on May 31st (1902), is an evidence that they reach maturity quickly. There must, therefore, be quite a number of different broods.

Professor Quaintance calls attention to the fact that when the worms are abundant in corn they may devour one another, thus reducing the number which actually mature. He also observes—and the same fact is evident to all who have observed—that the damage is not measured by the corn actually eaten, but also by the large amount which rots or molds as a result of the insect's work. The holes made through the husk also serve as entrance places for weevils.

#### REMEDIES.

When this insect attacks other plants, it is sometimes recommended to plant an occasional row of corn for the purpose of inducing the insects to attack the corn so the other crop will be spared. This is an evidence that it prefers corn to other food. This paves the way for a frank statement of the fact that no wholly satisfactory remedy for the Ear-worm in corn is known. Such methods as may be employed with reasonable hope of relief are mentioned below.

As the insect passes the winter in the pupa state in the earth, fall or winter plowing of badly infested lands will kill many of them. Experiments in Kansas<sup>1</sup> "showed that plowing infested cornfields 5 or 6 inches deep in late fall and early winter destroyed practically 100 per cent of the over-wintering pupæ." But in North Carolina it must be remembered that the insect develops in many other crops besides corn, especially cotton and tobacco; hence fields in which these crops stand until freezing weather will likely be infested as well as corn lands. Indeed, if the corn matures early, the latest broods must of necessity develop on other crops, chiefly cotton, hence the plowing of cornfields only would reach only a part of the insects.

In gardens and small patches of corn, something can be done by pinching the tips of the ears by hand, or even cutting off the ends of the ears and feeding them to stock, to prevent the worms going down the length of the whole ear. If the pinching method be used, it should be done several times, to kill as many as possible, for some of the young worms will likely escape each time.

If the corn matures very early, it will not be exposed to the later broods of worms, for the moths prefer to lay eggs on fresh silk and the worms will not work readily in hardened kernels. Thus early planting, and the use of early maturing varieties, would seem to be against the insect; but we must remember that early planted corn is, in general, more hurt by a number of other corn pests, and we do not believe, as yet, that the benefit of very early planting against this insect will amend

<sup>1</sup>Cir. No. 7, Kans. Exp. Sta., "Corn Ear-worm," by T. J. Headlee (1910?).

for its other disadvantages. We can conceive that any one planting in any one year might largely escape ear-worm by not being in tender silk when the adult moths were out in numbers. But we are not able to forecast the broods with sufficient exactness (nor can we know the rate with which the corn will grow) to make any positive recommendations on this point.

Let us hope that better remedies may be developed in the future.

#### WEEVILS (Several Species).

Orders *Lepidoptera* and *Coleoptera*.

*Description*.—Small or medium-sized insects which in the adult or larval state, or both, injure grain by eating into the kernels when stored, or by eating the meal or other products. Sometimes attack corn in the field before harvest. Often troublesome in mills, barns, stores, pantries, etc. The adult insects are moths or beetles.

*Injury in North Carolina*.—There are from eight to a dozen distinct kinds of "grain weevils" in North Carolina, and the total damage by them is great. Prof. R. I. Smith during some special studies of our grain weevils recorded at least nine species as known to him.<sup>1</sup> These were:

- (*Lepidoptera*) (Moths): Angoumois Grain Moth,  
Indian Meal Moth,  
Meal Snout Moth.  
(*Coleoptera*) (Beetles): Saw-toothed Grain Beetle,  
The Cadelle,  
Yellow Meal-worm,  
Dark Meal-worm,  
Granary Weevil,  
Rice Weevil ("Black Weevil").

Undoubtedly the most destructive "weevil" to our corn is the last one in the above list—the "Rice Weevil" or "Black Weevil." It has been sent in to us more often than any other kind. It appears to be the hardest of all the weevils to control. It also often infests the corn in the field, as the following letter from the southeastern part of the State, received August, 1912, shows:

"A year ago a large quantity of corn here was destroyed by weevils before taken from the field. This year a great deal of the early corn has one or two dozen weevils on each ear, and as the corn hardens it is being damaged."

Many other letters could be quoted showing this same general condition.

<sup>1</sup>Bul. 203, N. C. Exp. Sta., "Corn Weevils and Other Grain Insects." R. I. Smith, May, 1909.

*General Life-history of Grain Weevils.*—As there are a number of distinct kinds of grain weevils, some seeming to prefer ground grain products, the life-histories vary in details. The account here given is only meant to be general, giving an approximate idea of the whole group.

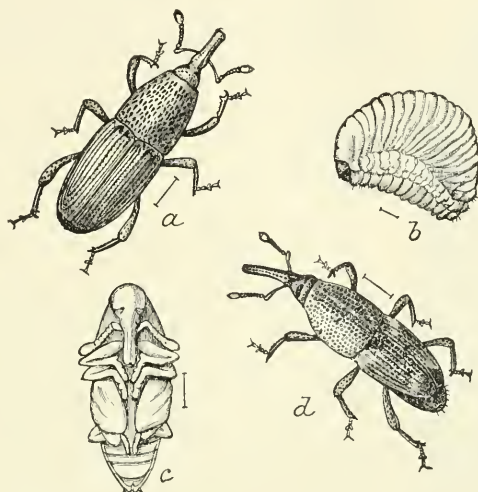


FIG. 18.—Grain Weevils (beetles), showing two closely related species at *a* and *d*; a larva at *b*, and pupa at *c*. Natural size indicated by lines. The one at *d* is the "Black Weevil," our most destructive corn weevil.

(After Chittenden, Div. Ent., U. S.  
Dept. Agr.)

The adult insects are moths or beetles, mostly small, but a few of medium size. These lay eggs on or in the grain or husk and the worms eat into the kernels. In some species the worm reaches full growth in the same kernel in which it first hatches; in others the same worm may live in several different kernels. When grown, the worm changes to a pupa from which the adult moth or beetle emerges later. In the case of weevils infesting meal, bran, and other ground materials, the worms burrow around in the material, frequently spinning a web which fastens little masses together. Meal and other products thus infested are apt to become moldy and unhealthy as food for both man and beast. Where the whole grain is infested, the vital germ is often eaten out, thus spoiling the grain for seeding purposes.

In the previous Bulletin of this Department on "Corn Insects" the writer stated that adult weevils had been found "passing the winter in the remnants of fodder where this had been pulled," but he has not now the original note at hand. His recollection is that it was the "Black Weevil," found in winter in the husk remaining attached to the stalk.

REMEDIES.<sup>1</sup>

*Prevention.*—Thorough cleaning out of old bins, sweeping out stray shattered grains, chaff, litter, etc., will get rid of many of the Weevils that are breeding in the bins so as to give the new crop a start with fewer Weevils to contend with in the beginning (save those in the corn when brought from the field).

The letter already quoted showed special damage to the early corn. Professor Hinds in Alabama in the bulletin already referred to, stated that up to midwinter his records showed "about fifty times as many Weevils on early corn as on late corn."

It is commonly believed in this State (and Professor Hinds mentions the same for Alabama) that corn stored in the husk is not so liable to Weevil attack. Prof. R. I. Smith, in the North Carolina Bulletin already referred to, calls attention to the fact that tight-fitting husks do appear to protect the corn to some extent. But the ear-worm has already often eaten holes through the husks so that Weevils gain entrance, and once the Weevils are in, the writer maintains, as in his previous Bulletin, that the husk merely hides the injury and causes the farmer to *think* that there is less Weevil. Professor Hinds says that the value of the husk as a protection depends on the *length and tightness* of the husk. On this point of storing in husk, we think we are safe in saying that it is not to be relied upon, except for those ears which have long tight husks. To depend on preventing Weevil merely by storing the whole crop in husk will result in many disappointments, for many of the ears will have torn or damaged husks, or ears protruding beyond the husk, etc., which will merely invite Weevil to enter.

Farmers in this State have also told us that if the corn be slightly dampened when stored (in husks) that it undergoes slight heating which seems to protect it from Weevil. Use of salt, ashes, lime, and cedar or pine twigs for

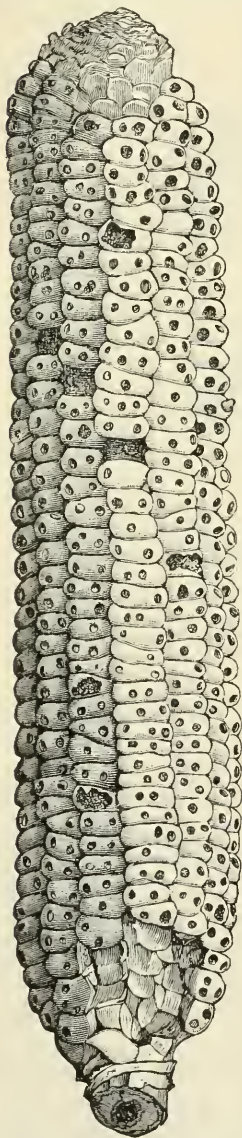


FIG. 19.—Ear of corn riddled by Angoumois Grain Moth. A case of excessive injury.

<sup>1</sup>In this account I have drawn upon Bul. 203, N. C. Exp. Sta., by R. I. Smith, already referred to, and on Bul. 176, Ala. Exp. Sta., "Reducing Insect Injury to Stored Corn," by W. E. Hinds, Feb., 1914.

putting in bin with the corn have all been mentioned, and must be classed among the remedies or preventives that have not been adequately proven. In his former Bulletin the writer stated that "shelled corn may be placed in absolutely tight bins and top of each bin covered with a complete layer of lime or ashes to depth of an inch. Of course, this is only practicable for those bins that are not being continually disturbed." This suggestion is not based on actual tests, but only as a chance to keep the Weevils out, and would be in no sense a remedy for those already in the corn.

*Fumigation Treatment.*—But for the Weevils that are already in the corn, or the ones that may gain entrance after it has been stored, we know of no treatment other than fumigation with some poisonous gas that can be relied upon, and some recent testimony shows this to be less certain than was formerly believed!

For this purpose the material known as carbon bisulphide (or carbon disulphide) has long been, and still is, the standard material. It is a clear, foul-smelling liquid which evaporates rapidly, giving off poisonous fumes. It is necessary to have the grain in some *tight* receptacle, *absolutely* tight if possible, or at least as near to it as possible. For small quantities, as for seed grain, etc., a water-tight barrel or cask can be used, or boxes if cracks and covers be sealed by pasting paper closely over them. The tighter the better, and the less the barrel, box, or bin approaches to perfect tightness the less perfect you must expect the result to be, and the greater amount of the material you must use in the *effort* to make amends for leaking of the gas.

A brand of the chemical especially made for insect work is manufactured by E. R. Taylor, Penn Yan, N. Y., under the name of "Fuma Carbon Disulphide," and is sold in lots of 50 lbs. or more. In small quantities the chemical can be had from, or ordered through, many drug stores, at retail prices of about 30 cents per pound (pint).

The amount to use is figured on the air space in the barrel, box, bin, or room (not merely on the amount of grain). Professor Hinds in Alabama says this should be *at the rate* of 5 to 8 lbs. for 1,000 cubic feet of space if the room or bin is quite tight, varying up to as high as 20 or 25 lbs. per 1,000 cubic feet of space if only moderately tight as by lathing the cracks, and says that for use in barrels ("for peas") "about one-half teacupful is sufficient if the top be tightly covered." The "Black Weevil" in corn may require more than this amount, perhaps three-fourths of cupful.

Professor Hinds says: "In making the application, level the surface and prepare small holes about a foot deep, about 3 to 4 ft. apart. Divide the liquid among these holes; pour direct on the corn in the holes and fill the holes with corn." If the room is large, begin on the farther end, working toward the door. "Close door tightly and quickly paste paper over the cracks; leave closed for at least 24 hours; no harm

if left indefinitely; fumigation is more effective during warm weather; never attempt it when temperature is below 60 degrees. A second treatment (stronger) should be given after a week or two if it appears that the first was not effective."

Prof. R. I. Smith, after working in North Carolina, became convinced "that carbon bisulphide, at any reasonable strength, cannot be successfully used in *ordinary* corn cribs, grain boxes, or storerooms. Small quantities can be fumigated in absolutely tight boxes or barrels by using about one ounce to three bushels; the top must be air-tight, not simply covered with blankets or canvas. Fumigation should continue for about 24 hours." He found that some stages of the insects would survive treatment; especially eggs and pupæ.

Which leads the present writer to insist that one may expect imperfect results, but still this fumigation method is the best known when once the corn is infested. Have the corn free to begin with, if possible, by cleaning the bins, and perhaps even throwing out ears already visibly infested; have the bins tight, so that they can be fumigated if necessary; use enough of the bisulphide to make allowance for leakage through such cracks as there may be; and finally, if the treatment seems not to have killed all, give a second treatment a week or two later to kill larvæ and adults which may have developed from eggs or pupæ which survived the first treatment.

*Caution.*—Carbon bisulphide is like benzine in its nature, both the liquid and its fumes being very inflammable, and no light or fire of any description can be brought near while the fumigation is going on, not even a lamp, cigar, or pipe. After the fumigation is over, open the bin (box, or room) and air out. If these cautions are heeded the material is safe to use.

*Heat.*—It has long been known that insects are killed by high temperatures, and this fact has been made use of recently in some striking tests by Mr. George A. Dean of the Kansas Experiment Station in ridding flour-mills of insects by the heat method.<sup>1</sup> In summarizing his work, he says:

"A temperature of from 118 to 125 degrees is sufficient for any part of the mill. This temperature should be held several hours to allow the heat to penetrate all the infested parts (of the mill)." But he also says: "I would not recommend heat for killing insects in stored seeds and grain. In case they are stored in small quantities, the heat method would be entirely satisfactory; but if in large quantities it would require too much heat to penetrate to center of bins."

### LESSER CORN INSECTS.

We have devoted the greater part of this BULLETIN to those insects which are regular serious pests of corn in this State. It now remains to make brief mention of a few which are of minor importance or which

<sup>1</sup>Jour. Ec. Ent., Vol. 6, p. 40, Feb., 1913.

are only occasionally destructive. For these we enter into no lengthy discussions either of injuries, life-histories, or remedies.

**Seed-corn Maggot** (Order *Diptera*).—A white maggot infesting seeds of corn, preventing germination. Once reported from Forsyth County as damaging corn which had been planted, and presumably the same once reported from Rowan County infesting planted seeds of melons. The attack is made after the seed is planted. The adult insect is a gray slender fly, smaller than house-fly. Remedies not very available, and in this State not much needed.

**Flea-beetles and Leaf-beetles** (Order *Coleoptera*).—Several species of these are known to attack young corn, eating the blades. Several complaints have been made in this State, but injury never widespread and usually not serious. Adult insects (which do the damage) are small, usually shining beetles, often jumping or dropping quickly when disturbed. Remedies scarcely necessary. Dusting with ashes, or with Paris-green in ashes or lime (1 ounce to 1 lb. ashes) would probably drive many away.

**Red Spider** (not a true insect).—This small creature is related to the spiders, mites, and ticks. Primarily a pest on cotton, sometimes on corn, peas, etc., especially in long hot spells. Rainy weather checks them.

**Grasshoppers** (Order *Orthoptera*).—We have many native kinds which feed on corn, but usually not destructive and the injury is soon outgrown. Some appear full-winged in spring, others are in young wingless state in spring and develop wings in summer and fall. When serious they can be combated by use of poisonous baits.

**Lady-beetles** (Order *Coleoptera*).—One of our most common Lady-

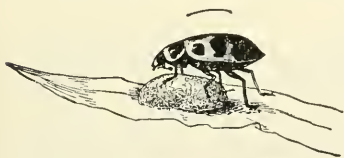


FIG. 20.—Lady-beetle (*Megilla maculata*) from which a parasite has emerged and spun its cocoon beneath the insect. Slightly enlarged, size of beetle indicated by line above. Lady-beetles of this species parasitized in this way may frequently be found on blades of corn.

(After Riley, Div. Ent., U. S. Dept. Agr.)

beetles is frequently seen on corn where it feeds to some extent on the pollen, blades, and the soft kernels. This is the Thirteen-spotted Lady-beetle (*Megilla maculata*). The species also feeds to some extent on other insects, and its larva is entirely insectivorous in its diet, feeding on plant-lice, slugs, etc. Frequently specimens of this beetle may be found on blades of corn standing over a small silken cocoon of yellowish or brownish color.

Such a cocoon contains a parasite, the larva of which has issued from the beetle. In a few days the adult parasite emerges from the cocoon as a small winged wasp-like creature, which goes off to seek a Lady-beetle victim. The beetle invariably dies soon after the parasite emerges.

**Stinging Caterpillars** (Order *Lepidoptera*).—There are two kinds of caterpillars frequently found on corn which if brushed against carelessly may produce painful stings. One of these is known as the Saddle-back

Caterpillar (*Sibenne stimulea*), so called from the peculiar saddle-like markings in the middle of the back. This caterpillar when grown is about an inch long. There are two projections at each end of the body which are directed upward and outward, and these projections as well as other parts of the body are armed with sharp brittle spines which readily pierce the skin and break off. The general color of the larva is greenish, with a reddish-brown patch resembling the saddle, and a similar patch at each end of the body from which the projections arise. The caterpillar when grown spins a cocoon from which it comes out as a brownish moth. There seems to be but one annual brood, the adult moths issuing in spring or early summer. Ammonia, bicarbonate of soda, or even strong brine, are recommended as antidotes for the sting.

Our other species of stinging caterpillar is the larva of the Io Moth (*Automeris io*). This is a rather handsome pea-green caterpillar attaining a length when full grown of two inches, with a purple stripe down each side of the body, the whole body armed with yellowish spines which are borne in clusters on little warts or tubercles. When grown the larva spins a brownish silken cocoon within which it transforms to a handsome moth, the males being yellowish and expanding two inches from tip to tip of the wings, and the females yellowish-brown and expanding as much as three inches in large specimens. In both sexes the hind wings are marked with conspicuous eye-spots.

**Other Caterpillars** (Order *Lepidoptera*).—Various caterpillars of many kinds may be found on the corn plant, all transforming to moths of some kind. Most of these, however, are not serious, or, if so, are only destructive in sporadic outbreaks.

\* \* \*

In concluding this BULLETIN it is but fair to repeat that in its preparation the writings of others have been freely drawn upon. Without crediting each statement made, the author has named the principal papers in footnotes. Many of our own observations are also included. It would take years and years of concentrated effort for any one person to work out all such facts as have been here recorded on the insects attacking this one crop—corn. But the writer is persuaded that there is a proper demand for bulletins of this type, each discussing all the more important insect pests of some one important crop. Such a bulletin cannot always be made up entirely of facts ascertained, proven, and tested by the writer in person.

The writer will welcome correspondence with corn-growers who make use of the suggestions contained herein, and who carefully watch the results. He also desires to be promptly informed in case of any serious outbreak of any corn pest not mentioned in these pages.

FRANKLIN SHERMAN, JR.,

Entomologist, Dept. Agriculture, Raleigh, N. C.

**THE BULLETIN**  
**OF THE**  
**NORTH CAROLINA**  
**DEPARTMENT OF AGRICULTURE,**  
**RALEIGH**

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Vol. 35, No. 6.

JUNE, 1914.

Whole No. 197.

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GARDEN

I. ANALYSES OF FERTILIZERS—SPRING SEASON, 1914.

II. REGISTRATION OF FERTILIZERS.

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PUBLISHED MONTHLY AND SENT FREE TO CITIZENS ON APPLICATION.

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‡In coöperation with Bureau of Plant Industry, United States Department of Agriculture.

## LETTER OF TRANSMITTAL.

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HON. W. A. GRAHAM,

*Commissioner of Agriculture.*

SIR:—I submit herewith analyses of fertilizers made in the laboratory of samples collected during the spring. These analyses show fertilizers to be about as heretofore, and to be, generally, what was claimed for them. I recommend that it be issued as the June BULLETIN.

Very respectfully,

B. W. KILGORE,

*State Chemist.*

Approved for printing:

W. A. GRAHAM,

*Commissioner.*



## I. ANALYSES OF FERTILIZERS—SPRING SEASON. 1914.

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By B. W. KILGORE.

W. G. HAYWOOD, J. Q. JACKSON, E. S. DEWAR, AND J. R. MULLEN.

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The analyses presented in this BULLETIN are of samples collected by the fertilizer inspectors of the Department, under the direction of the Commissioner of Agriculture, during the spring months of 1914. They should receive the careful study of every farmer in the State who uses fertilizers, as by comparing the analyses in the BULLETIN with the claims made for the fertilizers actually used, the farmer can know by or before the time fertilizers are put in the ground whether or not they contain the fertilizing constituents in the amounts they were claimed to be present.

### TERMS USED IN ANALYSES.

*Water-soluble Phosphoric Acid.*—Phosphate rock, as dug from the mines, mainly in South Carolina, Florida, and Tennessee, is the chief source of phosphoric acid in fertilizers.

In its raw, or natural state, the phosphate has three parts of lime united to the phosphoric acid (called by chemists tri-calcium phosphate). This is very insoluble in water and is not in condition to be taken up readily by plants. In order to render it soluble in water and fit for plant food, the rock is finely ground and treated with sulphuric acid, which acts upon it in such a way as to take from the three-lime phosphate two parts of its lime, thus leaving only one part of lime united to the phosphoric acid. This one-lime phosphate is what is known as water-soluble phosphoric acid.

*Reverted Phosphoric Acid.*—On long standing some of this water-soluble phosphoric acid has a tendency to take lime from other substances in contact with it, and to become somewhat less soluble. This latter is known as reverted or gone-back phosphoric acid. This is thought to contain two parts of lime in combination with the phosphoric acid, and is thus an intermediate product between water-soluble and the original rock.

Water-soluble phosphoric acid is considered somewhat more valuable than reverted, because it becomes better distributed in the soil as a consequence of its solubility in water.

*Available Phosphoric Acid* is made up of the water-soluble and reverted; it is the sum of these two.

*Water-soluble Ammonia.*—The main materials furnishing ammonia in fertilizers are nitrate of soda, sulphate of ammonia, cotton-seed meal, dried blood, tankage, and fish scrap. The first two of these (nitrate of soda and sulphate of ammonia) are easily soluble in water and become

well distributed in the soil where plant roots can get at them. They are, especially the nitrate of soda, ready to be taken up by plants, and are therefore quick-acting forms of ammonia. It is mainly the ammonia from nitrate of soda and sulphate of ammonia that will be designated under the heading of water-soluble ammonia.

*Organic Ammonia.*—The ammonia in cotton-seed meal, dried blood, tankage, fish scrap, and so on, is included under this heading. These materials are insoluble in water, and before they can feed plants they must decay and have their ammonia changed, by the aid of the bacteria of the soil, to nitrates, similar to nitrate of soda.

They are valuable then as plant food in proportion to their content of ammonia, and the rapidity with which they decay in the soil, or rather the rate of decay, will determine the quickness of their action as fertilizers. With short season, quick-growing crops, quickness of action is an important consideration, but with crops occupying the land during the greater portion or all of the growing season, it is better to have a fertilizer that will become available more slowly, so as to feed the plant till maturity. Cotton-seed meal and dried blood decompose fairly rapidly, but will last the greater portion, if not all, of the growing season in this State. While cotton seed and tankage will last longer than meal and blood, none of these act so quickly, or give out so soon, as nitrate of soda and sulphate of ammonia.

*Total Ammonia* is made up of the water-soluble and organic; it is the sum of these two.

The farmer should suit, as far as possible, the kind of ammonia to his different crops, and a study of the forms of ammonia as given in the tables of analyses will help him to do this.

#### VALUATIONS.

To have a basis for comparing the values of different fertilizer materials and fertilizers, it is necessary to assign prices to the three valuable constituents of fertilizers—ammonia, phosphoric acid, and potash. These figures, expressing relative value per ton, are not intended to represent crop-producing power, or agricultural value, but are estimates of the commercial value of ammonia, phosphoric acid, and potash in the materials supplying them. These values are only approximate (as the costs of fertilizing materials are liable to change, as other commercial products are), but they are believed to fairly represent the cost of making and putting fertilizers on the market. They are based on a careful examination of trade conditions, wholesale and retail, and upon quotations of manufacturers.

*Relative value per ton*, or the figures showing this, represents the prices on board the cars at the factory, in retail lots of five tons or less, for cash.

To make a complete fertilizer the factories have to mix together in proper proportions materials containing ammonia, phosphoric acid, and

potash. This costs something. For this reason it is thought well to have two sets of valuations—one for the raw or unmixed materials, such as acid phosphate, kainit, cotton-seed meal, etc., and one for mixed fertilizers.

The values used last season were:

#### VALUATIONS FOR 1913.

##### *In Unmixed or Raw Materials.*

For phosphoric acid in acid phosphate.....	4	cents per pound.
For phosphoric acid in bone meal and Peruvian Guano.	3½	cents per pound.
For phosphoric acid in basic slag.....	4	cents per pound.
For nitrogen .....	19½	cents per pound.
For potash .....	4	cents per pound.

##### *In Mixed Fertilizers.*

For phosphoric acid .....	4½	cents per pound.
For nitrogen .....	21	cents per pound.
For potash .....	5	cents per pound.

#### VALUATIONS FOR 1914.

##### *In Unmixed or Raw Materials.*

For phosphoric acid in acid phosphate.....	4	cents per pound.
For phosphoric acid in bone meal and Peruvian Guano and basic slag .....	4	cents per pound.
For nitrogen .....	19½	cents per pound.
For potash .....	4	cents per pound.

##### *In Mixed Fertilizers.*

For phosphoric acid .....	4½	cents per pound.
For nitrogen .....	21	cents per pound.
For potash .....	5	cents per pound.

#### HOW RELATIVE VALUE IS CALCULATED.

In the calculation of relative value it is only necessary to remember that so many per cent means the same number of pounds per hundred, and that there are twenty hundred pounds in one ton (2,000 pounds).

With an 8-2-1.65 goods, which means that the fertilizer contains available phosphoric acid 8 per cent, potash 2 per cent, and nitrogen 1.65 per cent, the calculation is made as follows:

<i>Percentage or Lbs. in 100 Lbs.</i>	<i>Value Per 100 Lbs.</i>	<i>Value Per Ton, 2,000 Lbs.</i>
8 pounds available phosphoric acid at 4½ cents..	0.36 × 20 =	\$ 7.20
2 pounds potash at 5 cents.....	0.10 × 20 =	2.00
1.65 pounds nitrogen at 21 cents.....	0.347 × 20 =	6.94
Total value .....	0.817 × 20 =	\$16.14

Freight and merchant's commission must be added to these prices.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.						Relative Value per Ton at Factory.
				Available Phosphate	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	
MIXED FERTILIZERS.										
Brands claiming										
3586	Georgia Chemical Works, Augusta, Ga.	Georgia Special Wheat and Corn Grower.	Greensboro	9.30	.93	.20	.82	1.00	4.00	\$ 14.64
3565	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Farmers' Favorite.	Monroe	8.22	.49	.70	1.19	1.45	3.92	16.32
Brands claiming										
3469	Acme Mfg. Co., Wilmington, N. C.	Acme Fertilizer.	Roseboro	7.74	1.15	1.28	2.06	2.50	3.00	18.85
3492	Craven Chemical Co., New Bern, N. C.	Marvel Great Crop Grower.	Mount Olive	8.21	1.09	1.20	2.29	2.78	3.54	20.55
5943	Union Guano Co., Winston, N. C.	Union Water Fowl Guano.	Hope Mills	9.74	.97	1.22	2.19	2.66	3.78	21.74
3494	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Blue Star C. S. M.	Mount Olive	8.28	1.13	1.18	2.31	2.81	2.72	19.87
Brand claiming										
5941	Acme Mfg. Co., Wilmington, N. C.	Acme Merito	Hope Mills	8.23	1.01	1.24	2.06	2.50	4.00	19.85
Brands claiming										
5942	American Fertilizing Co., Norfolk, Va.	Bone and Peruvian Guano	Hope Mills	9.84	1.43	1.14	2.57	3.12	2.72	22.37
3517	Baugh & Sons Co., Norfolk, Va.	Baugh's Animal Base and Potash Compound.	Wadesboro	7.66	1.21	.60	1.81	2.20	2.72	17.22
3654	Columbia Guano Co., Norfolk, Va.	Columbia Soluble Guano.	Conover	8.15	1.37	.36	1.73	2.10	1.96	16.56
3563	Patapsco Guano Co., Baltimore, Md.	Sea Gull Ammoniated Guano.	Monroe	7.99	1.33	.36	1.69	2.05	2.26	16.55
3566	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Cultivator Guano	Monroe	8.45	.81	1.10	1.91	2.32	2.34	17.96
3557	do	Piedmont Fish Guano	Edenton	8.51	.43	1.30	1.73	2.10	2.14	17.06

3672	Martin Fertilizer Co., Norfolk, Va.	Martin Carolina Cotton.	Clinton	7.42	.91	.66	1.57	1.91	2.06	15.33
3575	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' Cotton Grower.	New Bern	8.41	.51	1.34	1.85	2.25	2.56	17.90
3665	Navassa Guano Co., Wilmington, N. C.	Navassa Cotton Fertilizer.	Clinton	9.20	1.21	.30	1.51	1.84	1.76	16.38
5947	Royster, F. S., Guano Co., Norfolk, Va.	Farmers' Bone Fertilizer.	Hope Mills	7.89	.75	1.02	1.77	2.15	2.08	16.61
3680	Southern Cotton Oil Co., Shelby, N. C.	Southern Cotton Oil Co.'s Gloria Standard Fertilizer.	Grover	8.37	.51	1.14	1.65	2.00	2.26	16.72
5959	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Standard	Lincolnton	7.64	.97	.74	1.71	2.08	2.08	16.14
3532	Union Abattoir Co., Norfolk, Va.	Standard Grade.	Spring Hope	8.06	.60	1.50	2.13	2.59	2.26	18.46
3519	Union Guano Co., Winston, N. C.	Old Honesty Guano.	Wadesboro	8.52	.75	1.26	2.01	2.44	1.60	17.71
3547	Va-Car. Chemical Co., Richmond, Va.	Allison & Addison's Anchor Brand Fertilizer.	Asheville	8.83	1.33	.30	1.63	1.98	2.10	16.89
3520	do	Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano.	Wadesboro	8.39	1.15	.50	1.65	2.00	1.50	15.98
3643	do	Old Dominion Guano Co.'s Soluble Guano.	Statesville	8.65	1.19	.38	1.57	1.91	2.21	16.02
5926	do	Travers & Co.'s Beef, Blood, and Bone Fertilizer.	Elizabeth City	6.74	1.19	.58	1.77	2.15	2.04	15.34
3535	do	V-C. C. Co.'s Farmers' Friend Fertilizer.	Spring Hope	8.99	.59	1.32	1.91	2.32	3.30	19.41
<b>Brand claiming</b>										
5920	Baugh & Sons Co., Norfolk, Va.	Baugh's Complete Animal Base Fertilizer.	Oak City	7.74	1.01	.60	1.61	1.96	5.36	19.09
<b>Brand claiming</b>										
3527	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Pacific Tobacco and Cotton Grower.	Spring Hope	8.00	1.19	1.18	2.26	2.75	2.00	18.69
<b>Brands claiming</b>										
3624	Acme Mfg. Co., Wilmington, N. C.	Acme 8-3-3 Guano	Williamston	8.62	1.03	1.34	2.37	2.88	2.96	20.47
3700	do	Best's Fish Scrap Guano.	Goldsboro	8.59	1.43	.94	2.37	2.88	3.20	20.88
3651	do	Pee Dee Special Fertilizer.	Rowland	8.85	1.29	1.08	2.37	2.88	2.96	20.88
5883	American Fertilizer Co., Norfolk, Va.	American Eagle Guano.	Plymouth	7.43	2.69	.16	2.85	3.46	3.94	22.60
3652	do	do	Rowland	9.62	.75	.54	1.29	1.57	2.82	16.90
5918	Armour Fertilizer Works, Wilmington, N. C.	Armour's Cotton Special Fertilizer.	Vander	7.95	1.46	.70	2.16	2.63	2.90	19.13
3584	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Complete Fertilizer.	Asheville	6.86	.75	2.00	2.75	3.34	3.26	20.98
5904	Atlantic Chemical Co., Norfolk, Va.	Atlantic High Grade Tobacco Guano.	Robersonville	8.05	1.45	1.12	2.57	3.12	3.10	21.14

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.						Relative Value per Ton at Factory.	
				Available Phosphate.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.		
MIXED FERTILIZERS.											
Brands claiming											
3505	Baugh & Sons Co., Norfolk, Va.	Baugh's High Grade Tobacco Guano	Kinston	8.00				2.47	3.00	3.00	\$ 20.57
3516	do.	Baugh's Grand Rapids High Grade Guano.	Wadesboro	7.79	.73	1.89	2.61	3.17	3.38	21.35	
3530	Columbia Guano Co., Norfolk, Va.	Hyco Tobacco Guano.	Spring Hope	7.94	1.97	.62	2.59	3.15	3.32	21.34	
5895	Contentnea Guano Co., Wilson, N. C.	Pick Leaf	Dunn	8.00	1.77	.68	2.45	2.98	2.92	20.41	
3701	do.	do.	Kinston	8.66	1.17	1.20	2.37	2.88	3.58	21.33	
3725	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union Tobacco Guano	Nashville	8.44	1.31	.96	2.27	2.76	3.38	20.51	
3622	Farmers Cotton Oil Co., Wilson, N. C.	Golden Gem Guano.	Everetts	8.25	2.13	.36	2.49	3.03	3.28	21.16	
3528	Farmers Guano Co., Raleigh, N. C.	Golden Grade Guano.	Spring Hope	8.36	.75	2.54	3.29	4.00	2.56	23.90	
3709	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard's Yellow Wrapper Guano.	Ahoskie	7.17	1.17	1.72	2.89	3.51	3.08	21.67	
3515	Imperial Co., Norfolk, Va.	X. L. O. Cotton Guano.	Wilkesboro	7.95	2.37	.58	2.95	3.59	3.34	22.88	
5965	Josey, N. B., Guano Co., Tarboro, N. C.	Josey's Tip Top Guano.	Robersonville	8.01	1.95	.56	2.51	3.05	2.88	20.63	
3715	MacMurphy Co., Charleston, S. C.	Special 8-3-3 Cotton and Corn Guano.	Whiteville	9.37	.79	1.96	2.75	3.34	3.44	23.42	
5891	Martin Fertilizer Co., Norfolk, Va.	Martin's Bull Head Fertilizer	Dunn	8.14	1.54	.93	2.47	3.00	3.26	20.97	
5890	do.	Martin's Tobacco Special	Dunn	8.00	2.07	.34	2.41	2.93	3.42	20.74	
5877	McNair Phosphate Co., Laurinburg, N. C.	Oecola	Lane	7.59	1.99	.44	2.43	2.95	3.58	20.62	
3468	Navassa Guano Co., Wilmington, N. C.	Clarendon Tobacco Guano	Whiteville	7.69	1.23	1.20	2.43	2.95	3.64	20.77	
				8.79	.75	1.84	2.59	3.15	3.74	22.53	

5922	.....do.....	Navassa Standard Meal Guano.....	Halifax.....	10.19	1.12	1.20	2.32	2.82	3.68	22.59
3464	N. C. Cotton Oil Co., Wilmington, N. C.....	Carter's Lifter.....	Maxton.....	8.42	1.13	1.26	2.39	2.91	3.84	21.46
3465	.....do.....	Wilmington Farmer Boy.....	Maxton.....	8.47	1.09	1.28	2.37	2.88	4.26	21.83
3466	.....do.....	Wilmington High Grade.....	Whiteville.....	8.30	1.07	1.36	2.43	2.95	3.30	20.98
3620	New Bern Cotton Oil and Fertilizer Co., New Bern, N. C.....	Foy's High Grade Fertilizer.....	Everetts.....	7.67	1.37	1.60	2.97	3.61	3.34	22.72
6069	.....do.....	.....do.....	New Bern.....	8.46	.42	1.62	2.04	2.48	4.38	20.57
3667	.....do.....	Harvey's Special Meal and Fish Guano.....	Grifton.....	8.54	.45	1.94	2.39	2.91	4.00	21.72
3518	Piedmont-Mount Airy Guano Co., Baltimore, Md.....	Piedmont-Mount Airy High Grade Ammoniated Bone and Potash.....	Morven.....	8.39	1.51	1.18	2.69	3.27	2.92	21.77
3729	Planters Cotton-seed Oil Co., Rocky Mount, N. C.....	Planters Cotton-seed Oil Co.'s Tobacco Guano.....	Nashville.....	8.92	1.65	.82	2.47	3.00	3.26	21.45
5882	Pocomoke Guano Co., Norfolk, Va.....	Harvey's High Grade Monarch.....	Creswell.....	7.80	2.17	.44	2.61	3.17	3.08	21.06
3578	.....do.....	.....do.....	New Bern.....	7.56	2.07	.50	2.57	3.12	3.34	20.93
3728	.....do.....	Monarch Tobacco Grower.....	Battleboro.....	8.21	1.41	.96	2.37	2.88	3.08	20.42
3705	Powhatan Chemical Co., Richmond, Va.....	P. C. Co.'s Hustler.....	Kinston.....	8.70	1.81	.80	2.61	3.17	3.74	22.53
3732	Rasin-Monumental Co., Baltimore, Md.....	Rasin's Indian Brand for Tobacco.....	Nashville.....	8.84	2.11	.40	2.51	3.05	3.00	21.50
3600	Richmond Guano Co., Richmond, Va.....	Gilt Edge Fertilizer.....	Dunn.....	8.62	1.67	.82	2.49	3.03	3.40	21.62
5946	Royster, F. S., Guano Co., Norfolk, Va.....	Marlboro High Grade Cotton Grower.....	Hope Mills.....	7.99	1.31	1.20	2.51	3.05	3.12	20.85
3603	Scotland Neck Guano Co., Scotland Neck, N. C.....	State Farm C. S. Meal and Fish Scrap Guano.....	Dunn.....	7.97	.79	1.32	2.11	2.57	3.34	19.37
5934	.....do.....	.....do.....	Hookerton.....	8.79	.81	1.56	2.37	2.88	3.90	21.76
5948	Southern Cotton Oil Co., Fayetteville, N. C.....	Morning Glory.....	Fayetteville.....	8.25	.68	1.16	1.84	2.24	6.18	21.33
5949	.....do.....	Special Cotton Grower.....	Fayetteville.....	8.32	.62	1.16	1.78	2.16	3.94	18.90
3694	Southern Exchange Co., Maxton, N. C.....	Correct Cotton Compound.....	Parkton.....	10.47	1.59	.68	2.27	2.76	3.24	22.20
3601	Swift Fertilizer Works, Wilmington, N. C.....	Swift's Carolina High Grade Tobacco Grower.....	Smithfield.....	6.62	2.15	1.26	3.41	4.14	3.76	24.04
3478	.....do.....	Swift's Cotton-seed Meal Compound.....	Goldsboro.....	7.42	1.41	1.32	2.73	3.32	3.32	21.46
3658	Tuscarora Fertilizer Co., Greensboro, N. C.....	Tuscarora Blood and Bone.....	Newton.....	7.28	1.11	1.12	2.23	2.71	3.08	19.00
3531	Union Abattoir Co., Norfolk, Va.....	Cotton and Tobacco Guano.....	Spring Hope.....	8.34	1.87	.58	2.45	2.98	3.38	21.18
3673	Union Guano Co., Winston, N. C.....	Victoria High Grade Tobacco Grower.....	Clinton.....	8.84	2.15	.34	2.49	3.03	3.18	21.59

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.							Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.		
MIXED FERTILIZERS.											
Brands claiming											
5902	United States Fertilizer Co., Baltimore, Md.	Farm Bell Tobacco Special.	Greensboro	8.63	1.17	.98	2.47	3.00	3.00	\$ 20.57	
3004	Wilson Chemical Co., Wilson, N. C.	Plant Bed Tobacco Grower.	Dunn	8.29	1.51	1.18	3.69	4.49	3.14	20.54	
3582	Va.-Car. Chemical Co., Richmond, Va.	Davie & Whittle's Owl Brand Guano for Tobacco.	Kinston	8.42	2.17	.36	2.53	3.08	3.38	21.90	
3538	do	Norfolk and Carolina Chemical Co.'s Bright Leaf Tobacco Guano.	Spring Hope	8.19	2.31	.40	2.71	3.29	3.56	21.58	
3605	do	Powers, Gibbs & Co.'s Old Kentucky H. G. Tobacco Manure.	Selma	8.60	2.13	.36	2.49	3.03	2.84	22.31	
3510	do	Special H. G. Tobacco Fertilizer.	Kinston	8.12	1.45	1.06	2.51	3.05	3.86	21.04	
5962	do	V.-C. C. Co.'s Diamond C. S. M. Guano.	Robersonville	8.11	1.73	.98	2.71	3.29	2.96	21.71	
3636	do	V.-C. C. Co.'s Lion's H. G. Tobacco Fertilizer.	Wallace	8.69	2.07	.36	2.43	2.95	4.66	21.64	
3707	do	V.-C. C. Co.'s Valentine's Special	Kinston	8.80	1.93	.34	2.27	2.76	7.16	20.69	
Brand claiming				8.00			2.47	3.00	4.00	24.61	
3467	McNair Phosphate Co., Laurinburg, N. C.	Supply Company Special	Maxton	8.49	1.21	1.30	2.51	3.05	3.82	21.57	
Brands claiming				8.00			2.47	3.00	5.00	22.00	
6062	Josey, N. B., Guano Co., Tarboro, N. C.	Josey's Special Tobacco Guano.	Benson	8.61	.42	1.78	2.32	2.82	5.22	22.57	
5966	do	do	Robersonville	9.87	.82	1.62	2.44	2.97	4.94	22.71	
70	Martin Fertilizer Co., Norfolk, Va.	Martin's Cotton and Tobacco Guano.	Benson	8.26			2.21	2.69	4.72	24.07	
3629	Navassa Guano Co., Wilmington, N. C.	Navassa Blood and Meal Mixture	Wallace	8.15	1.51	1.30	2.81	3.42	5.44	21.44	
										24.58	

Brands claiming				8.00	2.47	3.00	7.50	25.07		
5905	N. C. Cotton Oil Co., Wilmington, N. C.	Best Tobacco Grower.....	Hobgood.....	7.40	1.16	1.20	2.36	2.87	8.86	25.43
3630	do.	do.	Wallace.....	8.02	1.60	.75	2.35	2.86	6.90	23.99
Brand claiming				8.00			2.47	3.00	10.00	27.57
3713	Baugh & Sons Co., Norfolk, Va.	Baugh's Fruit and Berry Guano.....	Chadbourne.....	8.04	2.25	.48	2.73	3.32	10.82	29.52
Brand claiming				8.00			3.29	4.00	3.00	24.02
3513	Va.-Car. Chemical Co., Richmond, Va.	Travers & Co.'s Capital Tobacco Fer- tilizer.	Greenville.....	7.56	2.93	.32	3.25	3.95	3.28	23.73
Brands claiming				8.00			3.29	4.00	4.00	25.02
3490	Acme Mfg. Co., Wilmington, N. C.	Acme O. K. Fertilizer.....	Mount Olive.....	7.97	1.95	1.40	3.35	4.07	4.16	25.40
3699	do.	Quickstep Fertilizer.....	Goldsboro.....	8.44	1.53	1.52	3.05	3.71	4.10	24.51
3556	American Agricultural Chemical Co., New York, N. Y.	Lazaretto Carolina Cotton Food.....	Edenton.....	8.17	.66	2.73	3.39	4.12	4.84	26.43
5884	American Fertilizer Co., Norfolk, Va.	N. C. and S. C. Cotton Grower.....	Plymouth.....	7.70	2.55	.74	3.29	4.00	3.58	24.33
5962	Atlantic Chemical Co., Norfolk, Va.	Oriental H. G. Guano.....	Robersonville.....	8.27	1.97	1.46	3.43	4.17	4.10	25.95
3625	Baugh & Sons Co., Norfolk, Va.	Baugh's Fish, Bone, and Potash.....	Robersonville.....	8.37	2.59	.76	3.35	4.07	4.62	26.22
5919	do.	do.	Oak City.....	8.24	2.68	.50	3.18	3.87	4.10	21.87
3623	Josey, N. B., Guano Co., Tarboro, N. C.	Josey's C. S. Meal and Fish Scrap.....	Robersonville.....	7.90	.71	2.10	2.81	3.42	4.26	23.17
3671	Martin Fertilizer Co., Norfolk, Va.	Martin's Red Star Brand Fertilizer.....	Clinton.....	9.71	2.31	.74	3.05	3.71	4.78	26.33
3594	do.	Martin's Tobacco Special.....	Dunn.....	8.80	1.08	2.37	3.45	4.19	4.38	26.79
3576	Meadows, E. H. & J. A. Co., New Bern, N. C.	Meadows' Ideal Tobacco Guano.....	New Bern.....	8.17	1.55	1.84	3.39	4.12	4.40	25.99
3462	Navassa Guano Co., Wilmington, N. C.	Coree Tobacco Guano.....	Wilmington.....	8.79	2.53	.21	2.77	3.37	4.48	24.02
5921	do.	Navassa Special Meal Fertilizer.....	Halifax.....	9.32	2.20	.94	3.14	3.82	3.52	25.10
5879	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Oriole Tobacco Grower.....	Resaca.....	9.10	1.33	1.92	3.25	3.95	5.18	27.02
3666	do.	do.	Grifton.....	8.77	1.01	1.82	2.83	3.44	4.34	24.12
3463	N. C. Cotton Oil Co., Wilmington, N. C.	Wilmington Truck Grower.....	Maxton.....	8.83	1.09	2.18	3.27	3.98	4.80	26.48
5958	Pocomoke Guano Co., Norfolk, Va.	Faultless Ammoniated Superphosphate.....	Lewiston.....	7.65	2.71	.66	3.37	4.10	4.36	25.40
3507	Powhatan Chemical Co., Richmond, Va.	North State Special.....	Kinston.....	8.34	2.29	.98	3.27	3.98	4.42	25.66



3693	<b>Brand claiming</b>		9.00		1.65	2.00	3.00	18.03
	Southern Cotton Oil Co., Charlotte, N. C.	Razem Fertilizer	7.64	.73	1.24	2.40	3.24	18.39
3726	<b>Brand claiming</b>		9.00			1.85	2.25	4.00
	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union Tobacco Guano	9.88	1.25	.60	2.25	4.50	21.16
3475	<b>Brands claiming</b>		9.00			2.26	2.75	2.00
	Acme Mfg. Co., Wilmington, N. C.	Acme Cotton Grower	9.95	1.03	1.36	2.39	2.91	2.04
3702	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Pacific Tobacco and Cotton Grower	9.08	.95	1.34	2.29	2.78	2.38
5923	Columbia Guano Co., Norfolk, Va.	Columbia C. S. M. Special	8.85	.88	1.16	2.04	2.48	2.36
3703	Navassa Guano Co., Wilmington, N. C.	Big Boll Special	9.55	1.22	1.07	2.29	2.78	2.32
3627	Va.-Car. Chemical Co., Richmond, Va.	Va.-Car. Chemical Co.'s Prolific Cotton Grower	8.09	.93	1.24	2.17	2.64	2.36
3657	<b>Brand claiming</b>		10.00			.82	1.00	3.00
	Swift Fertilizer Works, Wilmington, N. C.	Swift's Planters' Special Standard Grade Guano	7.75	1.39	.92	2.31	2.81	2.28
3504	<b>Brands claiming</b>		7.00			2.88	3.50	7.00
	Baugh & Sons Co., Norfolk, Va.	Baugh's Southern States Guano for Bright Tobacco	6.99	2.41	.60	3.01	3.66	7.14
5936	do.	do.	7.13	2.29	.56	2.85	3.46	6.98
3503	<b>Brand claiming</b>		7.00			3.29	4.00	4.00
	American Fertilizer Co., Norfolk, Va.	American Fish Scrap Guano	6.69	3.11	.36	3.47	4.22	4.52
3613	<b>Brands claiming</b>		7.00			3.29	4.00	8.00
	Baugh & Sons Co., Norfolk, Va.	Glover's Special Potato Guano	6.62	2.83	.52	3.35	4.07	8.24
3609	Martin Fertilizer Co., Norfolk, Va.	Abbott's Special Potato Guano	6.29	1.99	.90	2.89	3.51	8.34
3619	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Pasquotank Trucker	6.77	2.83	.32	3.15	3.83	8.20
5881	<b>Brands claiming</b>		7.00			4.11	5.00	5.00
	Pocomoke Guano Co., Norfolk, Va.	Standard Truck Guano	7.08	3.23	1.00	4.23	5.14	5.50
3614	do.	do.	7.17	3.11	1.00	4.11	5.00	5.08
3621	<b>Brand claiming</b>		7.00			4.11	5.00	7.00
	New Bern Cotton Oil and Fertilizer Co., New Bern, N. C.	Ives' Irish Potato Guano	7.16	2.13	1.14	3.27	3.98	8.62
		Everetts						28.80

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.						Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	
MIXED FERTILIZERS.										
	<b>Brand claiming</b>									
33635	Va.-Car. Chemical Co., Richmond, Va.	V.-C. Co.'s Special Truck Guano	Wallace	7.00	3.79	.20	4.11	5.00	7.00	\$ 30.56
	<b>Brand claiming</b>									
3374	Meadows, E. H. & J. A. Co., New Bern, N. C.	Meadows' Great Cabbage Guano	New Bern	7.04	3.99	1.90	5.89	7.16	6.98	38.05
	<b>Brands claiming</b>									
33633	Armour Fertilizer Works, Wilmington, N. C.	Armour's Velvet Leaf Fertilizer	Wallace	6.00	1.39	1.22	2.47	3.00	7.00	22.77
5968	Ober, G., & Sons Co., Baltimore, Md.	Ober's Red Seal Special Tobacco Guano	Middlesex	5.84	1.39	.54	2.61	3.17	6.32	22.54
	<b>Brand claiming</b>									
3489	Acme Mfg. Co., Wilmington, N. C.	Acme Truck Guano	Mount Olive	6.69	1.84		2.38	2.89	7.64	23.66
	<b>Brands claiming</b>									
3608	Imperial Co., Norfolk, Va.	Imperial Williams' Special Potato Guano	Elizabeth City	6.00	1.61	1.72	3.29	4.00	8.00	29.66
3615	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Special 5-6-5	Elizabeth City	7.42	1.61		3.33	4.05	6.10	26.76
3617	Troutman Mfg. Co., Churehland, Va.	Troutman's 5 Per Cent Guano	Elizabeth City	6.00			4.11	5.11	5.00	27.66
	<b>Brands claiming</b>									
3611	Baugh & Sons Co., Norfolk, Va.	Baugh's Peruvian Substitute for Potatoes, etc.	Elizabeth City	6.17	3.49	.88	4.07	4.95	5.40	28.05
3607	Imperial Co., Norfolk, Va.	Imperial 5-6-7 Potato Guano	Elizabeth City	5.39	2.39	1.30	3.69	4.49	5.08	25.43
3610	Martin Fertilizer Co., Norfolk, Va.	Martin's Animal Bone Potato Guano	Elizabeth City	6.99	2.75	1.76	4.51	5.48	4.94	30.17
	<b>Brands claiming</b>									
				6.00			4.11	5.00	7.00	29.66
				6.12	3.47	.70	4.17	5.07	7.60	30.62
				6.13	3.23	.88	4.11	5.00	7.76	30.54
				5.57	2.59	.90	3.49	4.24	8.58	28.25

5925	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Invincible.	Elizabeth City.	6.23	3.40	.50	3.90	4.74	6.20	28.19
3546	do	V.-C. C. Co.'s Special Truck Guano.	Brevard.	6.40	4.37	.30	4.67	5.68	8.68	31.05
5908	do	do	Belhaven.	6.32	3.71	.78	4.49	5.46	6.32	30.87
	<b>Brands claiming</b>			6.00			5.76	7.00	5.00	34.59
3626	Baugh & Sons Co., Norfolk, Va.	Baugh's 7 Per Cent Potato Guano.	Robersonville.	6.40	4.81	.80	5.61	6.82	5.54	34.86
3612	Martin Fertilizer Co., Norfolk, Va.	Martin's 7 Per Cent Guano.	Elizabeth City.	4.70	4.75	.96	5.71	6.94	5.42	33.63
	<b>Brand claiming</b>			2.00			7.29	8.86	5.00	37.42
5888	McNair Phosphate Co., Laurinburg, N. C.	Sodash.	Lane.	2.17	6.67	1.02	7.59	9.23	5.88	39.71
	<b>Brands claiming</b>			10.00					2.00	11.00
3682	Pocomoke Guano Co., Norfolk, Va.	10-2 Potash Mixture.	Maiden.	10.36					2.22	11.54
3661	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Bone and Potash Mixture.	Hickory.	9.94					2.30	11.25
	<b>Brands claiming</b>			10.00					4.00	13.00
3662	Columbia Guano Co., Norfolk, Va.	Columbia Bone and Potash Mixture.	Conover.	9.78					3.92	12.72
3592	Georgia Chemical Works, Augusta, Ga.	High Grade XX Acid Phosphate with Potash.	Greensboro.	10.62					3.14	12.70
3543	Patapsco Guano Co., Baltimore, Md.	Patapsco 10-4 Potash Mixture.	Kings Mountain.	10.14					3.90	13.03
3660	Swift Fertilizer Works, Wilmington, N. C.	Swift's Farmers' Home H. G. Phosphate.	Conover.	10.57					2.92	12.43
3659	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Acid and Potash.	Newton.	9.60					3.50	12.14
5950	do	do	Lincolnton.	9.85					3.14	12.00
3591	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Special Potash Mixture.	Burlington.	10.80					3.28	13.00
	<b>Brand claiming</b>			10.00					5.00	14.00
3550	Va.-Car. Chemical Co., Richmond, Va.	Va. State Fertilizer Co.'s Mountain Top Ashville Bone and Potash.	Ashville.	9.96					4.80	13.76
	<b>Brand claiming</b>			12.00			1.65	2.00		17.73
3632	Home Fertilizer and Chemical Co., Baltimore, Md.	Home Dissolved Animal Bone.	Wallace.	13.00			1.65	2.00		18.63
	<b>Brand claiming</b>						5.76	7.00	7.00	31.19
3639	Home Fertilizer and Chemical Co., Baltimore, Md.	Home Fertilizer.	Wallace.				4.91	5.97	9.42	30.04

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.					Relative Value per Ton at Factory.
				Available Phosphate	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	
RAW OR UNMIXED FERTILIZER MATERIALS.									
Brands claiming									
3798	Richmond Guano Co., Richmond, Va.	Premium Dissolved Bone	Mocksville	13.00					\$ 10.40
3799	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Dissolved Bone	Mocksville	13.51					10.81
Brands claiming									
3684	Armour Fertilizer Works, Greensboro, N. C.	Armour Acid Phosphate	Maiden	13.50					10.80
3697	McNair Phosphate Co., Laurinburg, N. C.	Acid Phosphate	Red Springs	14.00					11.20
3685	Pocomoke Guano Co., Norfolk, Va.	Peerless Acid Phosphate	Maiden	13.93					11.14
5951	Southern Cotton Oil Co., Fayetteville, N. C.	Peerless Acid Phosphate	Maiden	14.55					11.64
3695	Southern Cotton Oil Co., Goldsboro, N. C.	S. C. O. Co.'s 14 Per Cent Acid Phosphate.	Fayetteville	14.17					11.34
Brands claiming									
3754	Acme Mfg. Co., Wilmington, N. C.	do.	Red Springs	16.74					13.39
3788	American Agricultural Chemical Co., New York, N. Y.	do.	Red Springs	15.90					12.72
3745	Arps, George L., & Co., Norfolk, Va.	16 Per Cent Acid Phosphate	Raeford	16.00					12.80
3711	Baugh & Sons Co., Philadelphia, Pa.	Zell's 16 Per Cent Acid Phosphate	Dallas	16.46					13.17
3592	Boney, Paisley, Goldsboro, N. C.	Arps' High Grade 16 Per Cent	Edenton	16.54					13.23
3664	Columbia Guano Co., Norfolk, Va.	Baugh's 16 Per Cent Acid Phosphate	Tabor	16.23					12.98
3523	Conestee Chemical Co., Wilmington, N. C.	High Grade Acid Phosphate	Edenton	16.79					13.43
		Columbia High Grade 16 Per Cent Acid Phosphate.	Conover	16.41					13.13
		16 Per Cent Acid Phosphate	Wilkesboro	16.49					13.19
				17.62					14.10

3687	Contentnea Guano Co., Wilson, N. C.	High Grade 16 Per Cent Acid Phosphate.	Nashville	17.20	13.76
3567	Crow Bros., Monroe, N. C.	Crow's High Grade 16 Per Cent Acid	Monroe	16.42	13.14
3743	Eastern Cotton Oil Co., Hertford, N. C.	16 Per Cent Acid Phosphate	Elizabeth City	16.32	13.06
3812	Farmers Cotton Oil Co., Wilson, N. C.	Acid Phosphate	Wilson	16.49	13.19
3744	Foreign Products Co., Baltimore, Md.	High Grade Acid Phosphate	Edenton	16.37	13.10
3696	McNair Phosphate Co., Laurinburg, N. C.	Acid Phosphate	Red Springs	16.43	13.14
3675	Navassa Guano Co., Wilmington, N. C.	Navassa 16 Per Cent Acid Phosphate	Clinton	16.18	12.94
3764	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	16 Per Cent Acid Phosphate	New Bern	16.28	13.02
6070	do.	do.	New Bern	16.27	13.02
5893	Nitrate Agencies Co., Norfolk, Va.	High Grade Acid Phosphate	Fayetteville	16.47	13.18
3544	Patapco Guano Co., Baltimore, Md.	Florida Soluble Phosphate	Kings Mountain	16.19	12.95
3638	Pearsall & Co., Wilmington, N. C.	Pearsall's 16 Per Cent Acid Phosphate	Wallace	16.56	13.25
5912	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont 16 Per Cent Acid Phosphate	Bellairen	15.97	12.78
3686	Pocomoke Guano Co., Norfolk, Va.	Superb Acid Phosphate, 16 Per Cent	Maiden	17.22	13.78
3786	Powhatan Chemical Co., Richmond, Va.	Magic Dissolved Bone Phosphate	Waco	17.00	13.60
3570	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont 16 Per Cent Acid Phosphate	Monroe	16.03	12.82
3785	Richmond Guano Co., Richmond, Va.	Rex Dissolved Bone	Cherryville	16.59	13.27
5933	Scotland Neck Guano Co., Scotland Neck, N. C.	Our 16 Per Cent Acid Phosphate	Hockerton	15.89	12.71
3483	Swift Fertilizer Works, Wilmington, N. C.	Swift's Special High Grade Acid Phosphate	Goldsboro	16.00	13.28
3663	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Acid Phosphate	Newton	16.05	12.84
3522	Union Guano Co., Winston, N. C.	Union 16 Per Cent Acid Phosphate	Wadesboro	16.82	13.46
3552	Va.-Car. Chemical Co., Richmond, Va.	Atlantic and Virginia Fertilizer Co.'s Eureka Acid Phosphate.	Asheville	16.14	12.91
3568	do.	Durham Fertilizer Co.'s Best Acid Phosphate.	Monroe	15.87	12.70
5939	do.	Southern Chemical Co.'s Comet 16 Per Cent Acid Phosphate.	Lillington	16.17	12.94
3593	do.	Va.-Car. Chemical Co.'s 16 Per Cent Acid Phosphate.	Burlington	17.24	13.79



3628	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Ground Fish Guano	Williamston	6.79	8.26	26.48
	<b>Brands claiming</b>					
5981	Aene Mfg. Co., Wilmington, N. C.	Nitrate of Soda	Dunn	14.81	18.00	57.76
5987	Grace, W. R., & Co., New York, N. Y.	do	Fayetteville	15.00	18.24	58.50
3653	N. C. Cotton Oil Co., Wilmington, N. C.	do	Lillington	15.48	18.82	60.37
	<b>Brand claiming</b>					
6006	Nitrate Agencies Co., Norfolk, Va.	Nitrate of Soda	Palmyra	15.46	18.80	60.29
	<b>Brand claiming</b>					
5953	Royster, F. S., Guano Co., Norfolk, Va.	Nitrate of Soda	Hope Mills	15.00	18.24	58.50
				15.52	18.87	60.53
				15.22	18.50	59.36
				15.42	18.75	60.14

## BRANDS REGISTERED—SEASON 1914.

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
<i>Acme Manufacturing Co., Wilmington, N. C.—</i>			
16 Per Cent Acid Phosphate.....	16.00	....	....
Acme High Grade Acid Phosphate.....	14.00	....	....
Acme Bone and Potash.....	12.00	....	6.00
Acme Bone and Potash.....	12.00	....	5.00
Acme Bone and Potash.....	12.00	....	4.00
Acme Bone and Potash.....	12.00	....	3.00
Acme Bone and Potash.....	12.00	....	2.00
Acme Bone and Potash.....	11.00	....	6.00
Acme Bone and Potash.....	11.00	....	5.00
Acme Bone and Potash.....	11.00	....	4.00
Acme Bone and Potash.....	11.00	....	3.00
Acme Bone and Potash.....	11.00	....	2.00
Acme Melon Grower .....	10.00	3.30	5.00
Acme Bone and Potash.....	10.00	....	6.00
Acme Bone and Potash.....	10.00	....	5.00
Acme Bone and Potash.....	10.00	....	4.00
Acme Bone and Potash.....	10.00	....	3.00
Acme Bone and Potash.....	10.00	....	2.00
Acme Square Deal Fertilizer.....	9.25	1.65	2.00
Acme Square Deal Fertilizer for Tobacco....	9.25	1.65	2.00
Acme Cotton Grower .....	9.00	2.27	2.00
Acme Premo Guano .....	9.00	.82	3.00
Pumpelly's Special Tobacco Fertilizer.....	8.00	4.12	8.00
Acme Special Fertilizer for Cotton.....	8.00	4.12	7.00
Acme Special Fertilizer for Tobacco.....	8.00	4.12	7.00
B. & C. Co.'s Special Fertilizer.....	8.00	3.30	6.00
Acme Plumb Good Fertilizer.....	8.00	3.30	6.00
Acme Plumb Good Fertilizer for Tobacco....	8.00	3.30	6.00
Acme "OK" Fertilizer .....	8.00	3.30	4.00
Acme "OK" Fertilizer for Tobacco.....	8.00	3.30	4.00
Quick Step Fertilizer .....	8.00	3.30	4.00
Quick Step Fertilizer for Tobacco.....	8.00	3.30	4.00
Acme Crop Grower .....	8.00	2.47	4.00
Currie's High Grade Fertilizer.....	8.00	2.47	4.00
Acme Crop Grower for Tobacco.....	8.00	2.47	4.00
Best's Fish Scrap Guano for Tobacco.....	8.00	2.47	3.00
Best's Fish Scrap Guano.....	8.00	2.47	3.00
Pee Dee Special Fertilizer.....	8.00	2.47	3.00
Pee Dee Special for Tobacco.....	8.00	2.47	3.00
Acme S-3-3 C. S. M. Guano.....	8.00	2.47	3.00
Acme S-3-3 C. S. M. Guano for Tobacco.....	8.00	2.47	3.00
Acme Plant Food .....	8.00	2.47	2.50
Acme Fertilizer for Tobacco.....	8.00	2.47	2.50
Acme Plant Food for Tobacco.....	8.00	2.47	2.50
Acme Fertilizer .....	8.00	2.47	2.50
Acme Merito Mixture .....	8.00	2.06	4.00
Tip Top Crop Grower.....	8.00	2.06	3.00
Tip Top Tobacco Grower.....	8.00	2.06	3.00
Latimer's Complete Fertilizer .....	8.00	2.06	2.00
Acme Standard Guano .....	8.00	2.06	2.00
Best's Complete Fertilizer .....	8.00	2.06	2.00
Cotton-seed Meal Guano .....	8.00	1.65	2.00
Gem Fertilizer .....	8.00	1.65	2.00
Cotton-seed Meal Guano for Tobacco.....	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Gem Fertilizer for Tobacco.....	8.00	1.65	2.00
Acme Special Grain Fertilizer.....	8.00	1.65	2.00
Acme Bone and Potash.....	8.00	....	6.00
Acme Bone and Potash.....	8.00	....	5.00
Acme Bone and Potash.....	8.00	....	4.00
Acme Root Crop Guano.....	7.00	4.12	7.00
Acme Standard Truck Guano.....	7.00	4.12	5.00
Jefferson Cotton Grower .....	7.00	2.47	4.00
Acme High Grade Guano.....	6.00	4.94	8.00
Acme Truck Grower .....	6.00	3.30	8.00
Acme Corn Guano .....	6.00	2.47	3.00
Dried Ground Fish .....	4.50	7.81	....
Acme Special 4-10-4 Guano.....	4.00	8.25	4.00
Clark's Corn Guano .....	1.00	6.58	10.00
Sulphate of Ammonia .....	....	20.56	....
Nitrate of Soda .....	....	14.81	....
Dried Ground Blood .....	....	11.51	....
Acme Top Dresser .....	....	7.40	3.00
Cotton-seed Meal .....	....	6.17	....
Cotton-seed Meal .....	....	6.17	....
Sulphate of Potash .....	....	....	48.00
Muriate of Potash .....	....	....	48.00
High Grade German Kainit 16 Per Cent....	....	....	16.00
Genuine German Kainit .....	....	....	12.00

*American Agricultural Chemical Co., Baltimore,  
Greensboro, and New York—*

A. A. C. Co.'s 16 Per Cent Superphosphate...	16.00	....	....
Canton Chemical 16 Per Cent Acid Phosphate.	16.00	....	....
Detrick's 16 Per Cent Acid Phosphate.....	16.00	....	....
Lazaretto 16 Per Cent Acid Phosphate.....	16.00	....	....
Zell's 16 Per Cent Acid Phosphate.....	16.00	....	....
Lazaretto 14 Per Cent Acid Phosphate.....	14.00	....	....
Canton Chemical 14 Per Cent Acid Phosphate.	14.00	....	....
Detrick's XXtra Acid Phosphate.....	14.00	....	....
Zell's 14 Per Cent Acid Phosphate.....	14.00	....	....
Zell's 13 Per Cent Acid Phosphate.....	13.00	....	....
Detrick's H. G. Bone and Potash.....	12.00	....	5.00
Zell's H. G. Bone and Potash.....	12.00	....	5.00
Zell's Sterling High Grade.....	10.00	3.29	4.00
Lazaretto Sure Crop Compound.....	10.00	3.29	4.00
Champion Cotton Fertilizer .....	10.00	2.47	3.00
Excelsior Alkaline Bone .....	10.00	....	5.00
Zell's H. G. Bone and Potash.....	10.00	....	4.00
Canton Chemical Soluble Phosphate and Potash .....	10.00	....	4.00
Lazaretto H. G. Alkaline Bone.....	10.00	....	4.00
Zell's Bone and Potash.....	10.00	....	2.00
Lazaretto Alkaline Bone .....	10.00	....	2.00
Detrick's Bone and Potash.....	10.00	....	2.00
Canton Chemical Soluble Phosphate and Potash .....	10.00	....	2.00
A. A. C. Co.'s Top Notch Special.....	9.00	2.47	7.00
Zell's Royal High Grade Fertilizer.....	9.00	2.06	2.00
Detrick's Superior Animal Bone Fertilizer...	9.00	1.85	4.00
Canton Chemical Animal Bone Fertilizer...	9.00	1.85	4.00
Zell's Victoria Animal Bone Compound.....	9.00	1.85	4.00
Lazaretto Retriever Animal Bone Fertilizer..	9.00	1.85	4.00
Zell's Empire Cotton Compound.....	9.00	1.65	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Zell's Hustler Phosphate .....	9.00	.82	3.00
Mogul Fertilizer .....	9.00	.82	3.00
Pacific Guano for Tobacco.....	8.50	2.47	2.50
Reese's Potato and Truck Special.....	8.00	3.29	7.00
Zell's Popular Tobacco Manure.....	8.00	3.29	4.00
Detrick's Kangaroo Komplete Kompound Spe- cial High Grade .....	8.00	3.29	4.00
Lazaretto Carolina Cotton Food.....	8.00	3.29	4.00
A. A. C. Co.'s Palmetto C. S. M. Compound...	8.00	3.29	4.00
Canton Chemical Bono Tobacco Fertilizer....	8.00	3.29	4.00
Zell's Economizer Cotton Food.....	8.00	3.29	4.00
A. A. C. Co.'s Excelsior Compound for To- bacco .....	8.00	2.47	5.00
Detrick's Gold Eagle Cotton Compound.....	8.00	2.47	4.00
Detrick's Kangaroo Complete Compound for Tobacco .....	8.00	2.47	4.00
Lazaretto King of the Harvest.....	8.00	2.47	4.00
Zell's Tobacco Fertilizer .....	8.00	2.47	4.00
Canton Chemical Homestead Protector.....	8.00	2.47	4.00
Canton Chemical Gladiator Cotton Fertilizer.	8.00	2.47	3.00
A. A. C. Co.'s Eureka Cotton-seed Meal Com- pound .....	8.00	2.47	3.00
Detrick's Special Tobacco Fertilizer.....	8.00	2.47	3.00
Canton Chemical Baker's Tobacco Fertilizer..	8.00	2.47	3.00
Canton Chemical Superior High Grade Fer- tilizer .....	8.00	2.47	3.00
Detrick's Victory Cotton Fertilizer.....	8.00	2.47	3.00
Detrick's Kangaroo Komplete Kompound Bright Tobacco Grower .....	8.00	2.47	3.00
Lazaretto Carolina Tobacco Fertilizer.....	8.00	2.47	3.00
Detrick's Kangaroo Komplete Kompound for Cotton .....	8.00	2.47	3.00
Zell's Bright Tobacco Grower.....	8.00	2.47	3.00
Zell's Reliance High Grade Manure.....	8.00	2.47	3.00
Lazaretto New Rival Cotton Fertilizer.....	8.00	2.47	3.00
Lazaretto Special Tobacco and Potato Fertil- izer .....	8.00	2.47	3.00
Lazaretto Challenge Fertilizer .....	8.00	2.47	3.00
Canton Chemical CCC Special Compound....	8.00	2.06	6.00
Detrick's Vegetator Ammoniated Superphos- phate .....	8.00	2.06	3.00
Zell's "Square Deal" for Tobacco.....	8.00	2.06	3.00
Slingluff's British Mixture .....	8.00	2.06	2.50
Excelsior Bone Compound .....	8.00	1.65	5.00
Square Deal Phosphate .....	8.00	1.65	4.00
Savage, Son & Co.'s Brand Purity Guano....	8.00	1.65	2.00
Dawson's Crop Maker .....	8.00	1.65	2.00
Triumph Soluble Guano .....	8.00	1.65	2.00
Canton Chemical Baker's Fish Guano.....	8.00	1.65	2.00
Canton Chemical Game Guano.....	8.00	1.65	2.00
Detrick's Royal Crop Grower.....	8.00	1.65	2.00
Detrick's Fish Mixture .....	8.00	1.65	2.00
Lazaretto Crop Grower .....	8.00	1.65	2.00
Zell's Special Compound for Tobacco.....	8.00	1.65	2.00
Zell's Calvert Guano .....	8.00	1.65	2.00
Zell's Fish Guano .....	8.00	1.65	2.00
Reese's Pacific Guano .....	8.00	1.65	2.00
Detrick's Rival Tobacco Compound.....	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Detrick's Complete Compound for Grain and Grass .....	8.00	1.03	4.00
The A. A. C. Co.'s Fidelity Grain Grower....	8.00	.82	4.00
Lazaretto Peanut Grower .....	8.00	.82	4.00
A. A. C. Co.'s Regal Crop Grower.....	8.00	.82	3.00
Palmetto Alkaline Phosphate .....	8.00	....	4.00
Lazaretto Early Trucker .....	7.00	4.11	5.00
A. A. C. Co.'s Blood, Bone and Fish Com- pound .....	7.00	3.29	5.00
Lazaretto Truckers' Favorite .....	6.00	5.76	5.00
Lazaretto Empire Trucker .....	6.00	4.11	7.00
A. A. C. Co.'s Nitrate of Soda.....	....	15.00	....
A. A. C. Co.'s Baltimore Top Dresser.....	....	7.41	3.00
A. A. C. Co.'s Muriate of Potash.....	....	....	49.00
A. A. C. Co.'s Genuine German Kainit.....	....	....	12.00

*American Agricultural Chemical Co., Dixie Guano  
Branch, Spartanburg, S. C.—*

Dixie Acid Phosphate .....	16.00	....	....
Dixie Acid Phosphate .....	14.00	....	....
Dixie Bone and Potash .....	13.00	....	6.00
Dixie Bone and Potash .....	12.00	....	6.00
Dixie Fertilizer .....	10.00	3.30	4.00
Dixie Fertilizer .....	10.00	3.30	2.00
Dixie Fertilizer .....	10.00	2.47	4.00
Dixie Fertilizer .....	10.00	2.47	3.00
Dixie Blood, Bone and Potash.....	10.00	2.47	2.00
Dixie Money Maker Fertilizer .....	10.00	1.85	3.00
Dixie Blood, Bone and Potash.....	10.00	1.65	8.00
Dixie Fertilizer .....	10.00	1.65	4.00
Dixie Cotton Grower .....	10.00	1.65	3.00
Dixie Fertilizer .....	10.00	1.65	2.00
Dixie Grain Grower .....	10.00	.82	5.00
Dixie Bone and Potash .....	10.00	....	6.00
Dixie Bone and Potash .....	10.00	....	4.00
Dixie Bone and Potash .....	10.00	....	2.00
Dixie Beats All Fertilizer .....	9.20	1.65	2.00
Dixie Fertilizer .....	9.00	2.47	3.00
Dixie Fertilizer .....	9.00	2.47	2.00
Dixie Blood and Bone .....	9.00	1.65	3.00
Dixie Fertilizer .....	9.00	1.65	2.00
Dixie Fertilizer .....	8.00	4.12	7.00
Dixie Fertilizer .....	8.00	3.30	8.00
Dixie Fertilizer .....	8.00	3.30	4.00
Dixie Farmers' Favorite .....	8.00	2.47	3.00
Dixie Corn Grower .....	8.00	1.65	5.00
Dixie Special Corn Mixture .....	8.00	1.65	4.00
Dixie Bone and Potash .....	8.00	....	4.00
Dixie Potato Fertilizer .....	7.00	3.30	5.00
Dixie Lawn Grower .....	7.00	2.47	4.00
Dixie Special Garden Grower .....	7.00	2.47	4.00
Dixie Top Dresser .....	5.00	5.77	3.00

*American Agricultural Chemical Co., Farmers Fer-  
tilizer Works, Spartanburg, S. C.—*

Red Rooster Acid Phosphate .....	16.00	....	....
Red Rooster Acid Phosphate .....	14.00	....	....
Red Rooster Bone and Potash .....	13.00	....	6.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Red Rooster Bone and Potash .....	12.00	....	6.00
Red Rooster Fertilizer .....	10.00	3.30	4.00
Red Rooster Fertilizer .....	10.00	3.30	2.00
Red Rooster Fertilizer .....	10.00	3.30	....
Red Rooster Fertilizer .....	10.00	2.47	4.00
Red Rooster Fertilizer .....	10.00	2.47	3.00
Red Rooster Blood, Bone and Potash.....	10.00	2.47	2.00
Red Rooster Money Maker Fertilizer .....	10.00	1.85	3.00
Red Rooster Blood, Bone and Potash Fertilizer .....	10.00	1.65	8.00
Red Rooster Fertilizer .....	10.00	1.65	4.00
Red Rooster Cotton Grower .....	10.00	1.65	3.00
Red Rooster Fertilizer .....	10.00	1.65	2.00
Red Rooster Grain Grower .....	10.00	.82	5.00
Red Rooster Bone and Potash .....	10.00	....	6.00
Red Rooster Bone and Potash .....	10.00	....	4.00
Red Rooster Bone and Potash .....	10.00	....	2.00
Red Rooster Fertilizer .....	9.00	2.47	3.00
Red Rooster Fertilizer .....	9.00	2.47	2.00
Red Rooster Blood and Bone .....	9.00	1.65	3.00
Red Rooster Beats All Fertilizer .....	9.00	1.65	2.00
Red Rooster Fertilizer .....	8.00	4.12	7.00
Red Rooster Fertilizer .....	8.00	3.30	8.00
Red Rooster Fertilizer .....	8.00	3.30	4.00
Red Rooster Farmers' Favorite Fertilizer ...	8.00	2.47	3.00
Red Rooster Fertilizer .....	8.00	2.06	1.00
Red Rooster Corn Grower .....	8.00	1.65	5.00
Red Rooster Special Corn Mixture .....	8.00	1.65	4.00
Red Rooster Fertilizer .....	8.00	1.65	2.00
Top Notch C. S. M. Compound.....	8.00	1.65	2.00
Red Rooster Bone and Potash .....	8.00	....	4.00
Red Rooster Potato Fertilizer .....	7.00	3.30	5.00
Red Rooster Special Garden Grower .....	7.00	2.47	4.00
Red Rooster Lawn Grower .....	7.00	2.47	4.00
Red Rooster Top Dresser .....	5.00	5.75	3.00

*American Agricultural Chemical Co., Homestead  
Fertilizer Branch, Spartanburg, S. C.—*

Homestead Acid Phosphate .....	16.00	....	....
Homestead Acid Phosphate .....	14.00	....	....
Homestead Bone and Potash .....	13.00	....	6.00
Homestead Bone and Potash .....	12.00	....	6.00
Homestead Fertilizer .....	10.00	3.30	4.00
Homestead Fertilizer .....	10.00	3.30	2.00
Homestead Fertilizer .....	10.00	2.47	4.00
Homestead Fertilizer .....	10.00	2.47	3.00
Homestead Blood, Bone and Potash.....	10.00	2.47	2.00
Homestead Money Maker Fertilizer .....	10.00	1.85	3.00
Homestead Blood, Bone and Potash.....	10.00	1.65	8.00
Homestead Fertilizer .....	10.00	1.65	4.00
Homestead Cotton Grower .....	10.00	1.65	3.00
Homestead Fertilizer .....	10.00	1.65	2.00
Homestead Grain Grower .....	10.00	.82	5.00
Homestead Bone and Potash .....	10.00	....	6.00
Homestead Bone and Potash .....	10.00	....	4.00
Homestead Bone and Potash .....	10.00	....	2.00
Homestead Beats All Fertilizers .....	9.20	1.65	2.00
Homestead Fertilizer .....	9.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Homestead Fertilizer .....	9.00	2.47	2.00
Homestead Blood and Bone .....	9.00	1.65	3.00
Homestead Fertilizer .....	8.00	4.12	7.00
Homestead Fertilizer .....	8.00	3.30	8.00
Homestead Fertilizer .....	8.00	3.30	4.00
Homestead Farmers' Favorite .....	8.00	2.47	3.00
Homestead Fertilizer .....	8.00	2.06	1.00
Homestead Corn Grower .....	8.00	1.65	5.00
Homestead Special Corn Mixture .....	8.00	1.65	4.00
Homestead Fertilizer .....	8.00	1.65	2.00
Homestead Bone and Potash .....	8.00	....	4.00
Homestead Potato Fertilizer .....	7.00	3.30	5.00
Homestead Special Garden Grower .....	7.00	2.47	4.00
Homestead Lawn Grower .....	7.00	2.47	4.00
Homestead Top Dresser .....	5.00	5.77	3.00

*American Fertilizer Co., Norfolk, Va.—*

American Nonpareil Tobacco Grower .....	8.00	3.29	4.00
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*The Armour Fertilizer Works, Atlanta, Chicago,  
Wilmington, and Greensboro—*

Bone Meal .....	Total	24.00	2.47	....
Armour's Raw Bone Meal.....	Total	22.00	3.70	....
17 Per Cent Acid Phosphate.....		17.00	....	....
16 Per Cent Acid Phosphate.....		16.00	....	....
Star Phosphate 14 Per Cent .....		14.00	....	....
Acid Phosphate .....		14.00	....	....
Golden Grain Grower .....		13.00	....	4.00
13 Per Cent Acid Phosphate.....		13.00	....	....
Phosphate and Potash .....		12.00	....	6.00
Phosphate and Potash .....		12.00	....	5.00
12 Per Cent Acid Phosphate.....		12.00	....	....
Fertilizer, No. 1134 .....		11.00	2.47	4.00
Sampson Corn Mixture .....		11.00	....	5.00
Fertilizer, No. 1045 .....		10.00	3.30	5.00
Fertilizer, No. 1044 .....		10.00	3.30	4.00
Fertilizer, No. 1033 .....		10.00	2.47	3.00
Fertilizer, No. 1025 .....		10.00	1.65	5.00
Fertilizer, No. 1023 .....		10.00	1.65	3.00
Armour's Wheat Grower .....		10.00	1.65	2.00
Ammoniated Dissolved Bone and Potash.....		10.00	1.65	2.00
Special Mixture .....		10.00	1.03	6.00
Phosphate and Potash .....		10.00	....	6.00
Phosphoric Acid and Potash .....		10.00	....	5.00
Superphosphate and Potash .....		10.00	....	4.00
Acid and Potash .....		10.00	....	3.00
Phosphate and Potash, No. 1.....		10.00	....	2.00
Armour's Tobacco Champion .....		9.00	2.47	3.00
African Cotton Grower .....		9.00	2.47	3.00
Johnson's High Grade .....		9.00	2.05	5.00
Forsyth County Tobacco Special.....		9.00	2.05	3.00
Armour's Bright Tobacco Grower.....		9.00	1.65	3.00
Bone and Dissolved Bone with Potash.....		9.00	1.65	3.00
Fertilizer, No. 913 .....		9.00	.82	3.00
Armour's Phosphate and Potash.....		9.00	....	3.00
Tobacco Fertilizer .....		8.50	1.65	2.00
Standard Cotton Grower .....		8.50	1.65	2.00
Bone, Blood and Potash .....		8.00	4.11	7.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Young's Special .....	8.00	4.11	3.00
Van Lindley's Special .....	8.00	4.11	2.00
Fertilizer, No. 846 .....	8.00	3.30	6.00
Fertilizer, No. 844 .....	8.00	3.30	4.00
Special Trucker .....	8.00	3.30	4.00
Truck and Berry Special .....	8.00	2.47	10.00
Armour's S36 for Tobacco .....	8.00	2.47	6.00
Fertilizer, No. 836 .....	8.00	2.47	6.00
Special for Tobacco .....	8.00	2.47	5.00
Fertilizer, No. 835 .....	8.00	2.47	5.00
Fertilizer, No. 834 .....	8.00	2.47	4.00
Fertilizer, No. 833 .....	8.00	2.47	3.00
Underwood's Favorite .....	8.00	2.47	3.00
Cotton Special .....	8.00	2.47	3.00
Tobacco Special .....	8.00	2.47	3.00
Fertilizer, No. 832 .....	8.00	2.47	2.00
Berry King .....	8.00	2.05	4.00
Gold Medal for Tobacco .....	8.00	2.05	3.00
Sweet Potato Special .....	8.00	2.05	3.00
Champion .....	8.00	2.05	2.50
King Cotton .....	8.00	2.05	2.00
Slate's Tobacco Special .....	8.00	1.85	4.00
High Grade Potato .....	8.00	1.65	10.00
Fruit and Root Crop Special.....	8.00	1.65	5.00
Stokes & Co. Tobacco Special.....	8.00	1.65	5.00
Fertilizer, No. 825 .....	8.00	1.65	5.00
Fertilizer, No. 824 .....	8.00	1.65	4.00
Fertilizer, No. 823 .....	8.00	1.65	3.00
Carolina Cotton Special .....	8.00	1.65	3.00
Slaughter House for Tobacco.....	8.00	1.65	2.00
Armour's Slaughter House Fertilizer.....	8.00	1.65	2.00
General .....	8.00	1.65	2.00
Fertilizer, No. 815 .....	8.00	.82	5.00
Fertilizer, No. 814 .....	8.00	.82	4.00
Fertilizer, No. 813 .....	8.00	.82	3.00
Phosphate and Potash, No. 2.....	8.00	....	5.00
Phosphate and Potash, No. 3.....	8.00	....	4.00
Fertilizer, No. 758 .....	7.00	4.11	8.00
7 Per Cent Trucker .....	6.00	5.76	5.00
5 Per Cent Trucker .....	6.00	4.11	7.00
Manure Substitute .....	6.00	3.30	4.00
Armour's Velvet Leaf .....	6.00	2.47	7.00
10 Per Cent Trucker .....	5.00	8.23	3.00
Top Dresser .....	5.00	8.23	2.00
Armour's Top Dresser .....	4.00	6.18	2.50
Special Formula for Tobacco.....	4.00	3.30	5.00
Harvey's Special .....	4.00	3.30	4.00
Harris Electric Top Dresser.....	2.00	8.23	3.00
Armour's Top Dresser .....	....	7.83	4.00
Armour's Top Dresser .....	....	7.40	3.00
Sulphate of Ammonia .....	....	20.00	....
Nitrate of Soda .....	....	14.81	....
Blood .....	....	13.16	....
10 Per Cent Tankage.....	....	8.23	....
Cotton-seed Meal .....	....	6.18	....
Sulphate of Potash .....	....	....	50.00
Muriate of Potash .....	....	....	50.00
Kainit .....	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
<i>George L. Arps &amp; Co., Norfolk, Va.—</i>			
Arps' H. G. 16 Per Cent Acid Phosphate.....	16.00	....	....
14 Per Cent Acid Phosphate.....	14.00	....	....
Arps' 10 and 4 Bone and Potash Mixture.....	10.00	....	4.00
Arps' 10 and 2 Bone and Potash Mixture.....	10.00	....	2.00
Arps' "Go-a-head" Guano for Trucks, Cotton and Tobacco .....	8.00	3.30	4.00
Arps' Quick Growth for All Crops.....	8.00	2.47	3.00
Arps' Premium Guano for Cotton, Tobacco, and All Spring Crops.....	8.00	1.65	2.00
Arps' Big Yield Guano.....	8.00	1.65	2.00
Arps' Standard Truck Guano .....	7.00	4.12	5.00
Arps' Potato Guano .....	6.00	5.76	5.00
Arps' Scuppernong Guano for Trucks.....	6.00	4.12	7.00
Arps' H. G. Top Dresser.....	....	8.22	3.00
Genuine German Kainit .....	....	....	12.00

*Ashepoo Fertilizer Co., Charleston, S. C.—*

High Grade Ashepoo Dissolved Phosphate....	16.00	....	....
H. G. Bradley's Dissolved Phosphate.....	16.00	....	....
High Grade Ashepoo Acid Phosphate.....	14.00	....	....
H. G. Bradley's Acid Phosphate.....	14.00	....	....
Standard Bradley's Acid Phosphate.....	13.00	....	....
Standard Quinipiac Acid Phosphate .....	13.00	....	....
Standard Ashepoo Acid Phosphate .....	13.00	....	....
H. G. Ashepoo Bone and Potash.....	12.00	....	2.00
Standard Ashepoo Acid Phosphate and Potash	12.00	....	1.00
Standard Eutaw Acid Phosphate and Potash.	12.00	....	1.00
Standard Bradley's Acid Phosphate.....	12.00	....	....
Standard Ashepoo Acid Phosphate.....	12.00	....	....
Standard Eutaw Acid Phosphate .....	12.00	....	....
Standard Ashepoo Potash and Acid Phosphate	11.00	....	1.00
Standard Eutaw Potash Acid Phosphate....	11.00	....	1.00
High Grade Ashepoo Watermelon Guano....	10.00	3.29	5.00
H. G. Ashepoo Cantaloupe Guano.....	10.00	2.46	10.00
H. G. Ashepoo Fruit Fertilizer.....	10.00	1.65	6.00
High Grade Bradley's Guano.....	10.00	1.65	4.00
H. G. Ashepoo Fertilizer.....	10.00	1.65	2.00
High Grade Ashepoo Superpotash Acid Phos- phate .....	10.00	....	4.00
H. G. Bradley's Potash Acid Phosphate.....	10.00	....	4.00
H. G. Eutaw Superpotash Acid Phosphate ...	10.00	....	4.00
Standard Bradley's Wheat Grower .....	10.00	....	2.00
Standard Enoree Acid Phosphate and Potash.	10.00	....	2.00
Standard Ashepoo Fertilizer .....	9.00	1.85	1.00
Standard Eutaw Fertilizer .....	9.00	1.85	1.00
Standard B. D. Sea Food Guano.....	9.00	1.85	1.00
Standard Bradley's Patent Superphosphate...	9.00	1.85	1.00
Standard Quinipiac Pine Island Ammoniated Superphosphate .....	9.00	1.85	1.00
Standard Cumberland Bone Superphosphate of Lime .....	9.00	1.85	1.00
Standard Americus Ammoniated Bone Super- phosphate .....	9.00	1.85	1.00
Standard Eutaw Guano .....	9.00	1.65	2.00
Standard Eutaw XX Guano.....	9.00	1.65	2.00
Standard Ashepoo Guano .....	9.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Standard Soluble Pacific Guano .....	9.00	1.65	2.00
Standard Ashepoo Guano .....	9.00	1.65	1.00
High Grade Bradley's Guano.....	8.00	3.29	4.00
High Grade Ashepoo Guano.....	8.00	3.29	4.00
High Grade Eutaw Special Cotton-seed Meal Guano .....	8.00	2.46	4.00
High Grade Eutaw Fertilizer.....	8.00	2.46	4.00
High Grade Bradley's Guano.....	8.00	2.46	3.00
High Grade Pacific Fertilizer.....	8.00	2.46	3.00
High Grade Ashepoo Cotton Fertilizer.....	8.00	2.46	3.00
High Grade Ashepoo Bird and Fish Guano...	8.00	2.46	3.00
High Grade Ashepoo Meal Mixture.....	8.00	2.46	3.00
High Grade Ashepoo Golden Tobacco Producer	8.00	2.46	3.00
High Grade Ashepoo Fertilizer.....	8.00	2.46	3.00
Standard Ashepoo Meal Guano.....	8.00	2.46	2.00
Standard Ashepoo Guano .....	8.00	2.06	2.00
Standard Eutaw Guano .....	8.00	2.06	2.00
Standard Ashepoo Fertilizer .....	8.00	1.65	2.00
Standard Bradley's Guano .....	8.00	1.65	2.00
Standard Brownwood Potash Acid Phosphate.	8.00	....	4.00
Sulphate of Ammonia .....	....	14.81	....
Muriate of Potash .....	....	....	45.00
Sulphate of Potash .....	....	....	45.00
German Kainit .....	....	....	12.00

*Atlanta Milling Co., Atlanta, Ga.—*

Cotton-seed Meal .....	....	7.50	....
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*The Atlantic Chemical Corporation, Norfolk, Va.—*

Pure Raw Bone Meal.....Total	21.50	3.71	....
Acco Thomas Phosphate .....	18.00	....	....
Atlantic High Grade 16 Per Cent Acid Phos- phate .....	16.00	....	....
Atlantic 14 Per Cent Acid Phosphate.....	14.00	....	....
Atlantic Dissolved Bone .....	13.00	....	....
Atlantic Corn Special .....	12.00	1.02	2.00
Atlantic Acid Phosphate .....	12.00	....	....
Atlantic 11 and 5 Bone and Potash Mixture..	11.00	....	5.00
Atlantic 10 and 5 Bone and Potash Mixture..	10.00	....	5.00
Atlantic 10 and 4 Bone and Potash Mixture..	10.00	....	4.00
Atlantic Bone and Potash for Grain.....	10.00	....	3.00
Atlantic Bone and Potash Mixture.....	10.00	....	2.00
Acco Tobacco Compound .....	9.00	2.47	3.00
Atlantic Meal Compound .....	9.00	2.27	2.00
Atlantic Cotton Grower .....	9.00	2.06	1.00
Corona Cotton Compound .....	9.00	1.65	3.00
Atlantic Special Guano .....	9.00	1.65	1.00
Atlantic Grain Guano .....	9.00	.82	3.00
Atlantic Fish Guano .....	9.00	.82	3.00
Atlantic Special 1-9-2 Guano .....	9.00	.82	2.00
Atlantic 4-8-5 Special Tobacco Grower.....	8.00	3.30	5.00
Atlantic Special Truck Guano.....	8.00	3.30	4.00
Oriental High Grade Guano .....	8.00	3.30	4.00
Paloma Tobacco Guano .....	8.00	3.30	4.00
Pitt County Light Tobacco Special.....	8.00	2.47	5.00
Boone's Special .....	8.00	2.47	4.00
Atlantic High Grade Tobacco Guano.....	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Atlantic High Grade Cotton Guano.....	8.00	2.47	3.00
Atlantic Tobacco Grower .....	8.00	2.06	3.00
Atlantic Tobacco Compound .....	8.00	2.06	2.00
Atlantic Special Wheat Fertilizer .....	8.00	1.65	2.00
Atlantic Soluble Guano .....	8.00	1.65	2.00
Atlantic Soluble Guano for Tobacco.....	8.00	1.65	2.00
Apex Peanut Grower .....	8.00	1.02	4.00
Atlantic 8 and 5 Bone and Potash Mixture...	8.00	....	5.00
Atlantic 8 and 4 Bone and Potash Mixture...	8.00	....	4.00
Atlantic 7 Per Cent Truck Guano.....	7.00	5.77	7.00
Atlantic Potato Guano .....	7.00	4.12	5.00
Perfection Peanut Grower .....	7.00	....	5.00
Atlantic Special Potato Guano.....	6.00	4.12	7.00
Atlantic 2-6-5 Special .....	6.00	1.65	5.00
Atlantic Side Dresser .....	4.00	8.22	4.00
Atlantic Special Top Dresser.....	4.00	6.18	2.50
Nitrate of Soda .....	....	15.22	....
Atlantic Top Dresser .....	....	7.42	3.00
Cotton-seed Meal .....	....	6.17	....
Sulphate of Potash .....	....	....	48.00
Muriate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00

*Atlantic Fertilizer Co., Atlanta, Ga.—*

Atlantic Acid and Potash Mixture H. G. ....	12.00	....	6.00
Atlantic Acid and Potash Mixture H. G. ....	10.00	....	5.00

*Baltimore Fertilizer Co., Baltimore, Md.—*

Honest Acid Phosphate .....	16.00	....	....
Honest Acid Phosphate .....	14.00	....	....
Honest Bone and Potash.....	10.00	....	2.00
Honest 4-8-5 .....	8.00	3.20	5.00
Honest Sweet Potato Grower.....	8.00	2.40	4.00
Honest Cotton Grower .....	8.00	2.40	3.00
Honest Ammoniated Bone .....	8.00	1.60	2.00
Honest Dixie Trucker .....	6.00	4.00	7.00
Honest Trucker .....	6.00	4.00	5.00

*Baugh & Sons Co., Philadelphia, Pa., and Norfolk, Va.—*

Baugh's Raw Bone Meal, Warranted Pure, Total .....	21.50	3.70	....
Baugh's 16 Per Cent Acid Phosphate.....	16.00	....	....
Baugh's Pure Bone and Muriate of Potash Mixture .....	15.00	2.47	5.00
Baugh's High Grade Acid Phosphate.....	14.00	....	....
Baugh's Pure Dissolved Animal Bones.....	13.00	2.06	....
Baugh's 12 and 5 Phosphate and Potash....	12.00	....	5.00
Baugh's High Grade Cotton and Truck Guano	10.00	1.65	2.00
Baugh's 10 and 8 Phosphate and Potash....	10.00	....	8.00
Baugh's 10 and 4 Phosphate and Potash Mix- ture .....	10.00	....	4.00
Baugh's Soluble Alkaline Superphosphate....	10.00	....	2.00
Baugh's Grain and Grass Grower.....	9.00	.82	2.00
Baugh's H. G. Potato Grower.....	8.00	3.30	10.00
Baugh's Fish, Bone and Potash.....	8.00	3.30	4.00
Baugh's Yucatan Special Tobacco Guano....	8.00	3.30	4.00
Baugh's Fruit and Berry Guano.....	8.00	2.47	10.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Baugh's Special Tobacco Guano.....	8.00	2.47	5.00
Baugh's Grand Rapids High Grade Guano...	8.00	2.47	3.00
Baugh's Sweet Potato Guano for Sweet Potatoes .....	8.00	2.47	3.00
Baugh's High Grade Tobacco Guano.....	8.00	2.47	3.00
Baugh's Complete Animal Base Fertilizer....	8.00	1.65	5.00
Baugh's Fish Mixture .....	8.00	1.65	2.00
Baugh's Animal Base and Potash Compound for All Crops .....	8.00	1.65	2.00
Baugh's Wheat Fertilizer for Wheat and Grass	8.00	1.65	2.00
Baugh's Southern States Excelsior Guano....	8.00	1.00	3.00
Baugh's Southern States Guano for Bright Tobacco .....	7.00	2.88	7.00
Baugh's Potato and Truck Special.....	7.00	2.88	7.00
Baugh's Strawberry Mixture .....	7.00	2.47	5.00
Baugh's Fine Ground Fish.....Total	6.87	8.23	....
Baugh's 7 Per Cent Potato Guano.....	6.00	5.76	5.00
Baugh's P. P. P. Plentiful Potato.....	6.00	4.94	6.00
Baugh's Peruvian Guano Substitute for Potatoes for All Vegetables.....	6.00	4.12	7.00
Baugh's Farmers' Friend Guano .....	6.00	4.12	7.00
Baugh's New Process 10 Per Cent Guano....	5.00	8.23	2.50
Baugh's Special Potato Manure.....	5.00	1.65	10.00
H. G. Tankage .....	4.00	6.58	....
Sulphate of Ammonia .....	....	20.57	....
Nitrate of Soda .....	....	15.63	....
Fine Ground Dried Blood.....	....	13.17	....
Baugh's Soluble Top Dresser for All Crops...	....	8.23	3.00
Muriate of Potash .....	....	....	50.00
High Grade Sulphate of Potash.....	....	....	48.00
Genuine German Kainit .....	....	....	12.40

*The Berkley Chemical Co., Norfolk, Va.—*

Pure Ground Bone .....	Total	20.00	3.70	....
Resolute Acid Phosphate .....	16.00	....	....	....
Berkley Acid Phosphate .....	14.00	....	....	....
Berkley 12-5 Bone and Potash .....	12.00	....	....	5.00
Berkley Bone and Potash Mixture.....	11.00	....	....	2.00
Berkley Plant Food .....	10.00	....	....	4.00
Laurel Potash Mixture .....	10.00	....	....	2.00
Monitor Animal Bone Fertilizer.....	9.00	1.85	....	4.00
Select Crop Grower .....	8.50	2.06	....	2.50
Victory Special Crop Grower.....	8.00	3.29	....	4.00
Berkley H. G. Tobacco Grower.....	8.00	3.29	....	4.00
Berkley Tobacco Guano .....	8.00	2.47	....	3.00
Advance Crop Grower .....	8.00	2.47	....	3.00
Brandon Superphosphate .....	8.00	1.65	....	2.00
Long Leaf Tobacco Grower.....	8.00	1.65	....	2.00
Berkley Peanut and Grain Grower.....	8.00	1.00	....	4.00
Superior Bone and Potash.....	8.00	....	....	4.00
Mascot Truck Guano .....	7.00	4.11	....	5.00
Royal Truck Grower .....	6.00	5.76	....	5.00
The Leader of the World.....	5.00	3.29	....	5.00
Berkley Top Dresser .....	4.00	8.23	....	2.00
Nitrate of Soda .....	....	15.00	....	....
Dry Ground Fish .....	....	8.23	....	....
Special Top Dresser .....	....	7.41	....	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Muriate of Potash .....	....	....	49.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00
<i>Beta Fertilizer Co., Beta, N. C.—</i>			
Beta Grass and Grain Fertilizer.....	10.00	....	2.00
Beta Potato and Truck .....	8.00	4.00	7.00
Beta Fertilizer .....	8.00	4.00	4.00
Beta Special Corn Grower.....	8.00	3.00	5.00
Beta Special Cotton .....	8.00	3.00	3.00
Beta Regulator Corn Grower.....	8.00	2.00	2.00
Beta Special Lawn .....	4.00	2.00	2.00
<i>S. T. Beveridge &amp; Co., Richmond, Va.—</i>			
Beveridge's Raw Ground Bone Meal....Total	20.00	3.70	....
Beveridge's Thomas or Basic Slag.....Total	20.00	....	....
Beveridge's Thomas or Basic Slag.....Total	17.00	....	....
<i>Blackstone Guano Co., Inc., Blackstone, Va.—</i>			
Clover Leaf 16 Per Cent Phosphate.....	16.00	....	....
Bone and Phosphate Half and Half.....	15.00	1.65	....
Bla. G. Co., Inc., Acid Phosphate.....	14.00	....	....
Clover Leaf for Grain .....	13.00	1.03	1.00
Dissolved Bone .....	10.00	1.03	1.00
B. G. Co., Inc., Bone and Potash.....	10.00	....	4.00
B. G. Co., Inc., Bone and Potash.....	10.00	....	2.00
Blackstone Special for Tobacco .....	9.00	2.47	3.00
Old Bellefonte .....	8.00	3.30	2.00
Clover Leaf for Tobacco .....	8.00	2.47	3.00
Tobacco Special .....	8.00	2.47	3.00
Wrapper Brand .....	8.00	2.47	3.00
Jim Crow for Tobacco .....	8.00	2.47	3.00
Bellefonte .....	8.00	2.47	2.00
Hard Cash for Tobacco .....	8.00	2.06	2.00
Carolina Special for Tobacco .....	8.00	1.65	4.00
Standard Guano .....	8.00	1.65	2.00
Red Letter for Tobacco .....	8.00	1.65	2.00
Alliance for Tobacco .....	8.00	1.65	2.00
Leader for Tobacco .....	8.00	1.65	2.00
Peanut Special .....	8.00	1.03	6.00
Material for Special Order .....	....	4.05	....
<i>Bowker Fertilizer Co., Baltimore, Md., and Boston, Mass.—</i>			
16 Per Cent Dissolved Bone Phosphate.....	16.00	....	....
Bowker's Soluble Phosphate .....	14.00	....	....
Golden Harvest Fertilizer .....	12.00	....	5.00
Imperial Alkaline Phosphate .....	10.00	....	4.00
Superphosphate with Potash for Grass and Grain .....	10.00	....	2.00
Animal Bone Fertilizer .....	9.00	1.85	4.00
Blood, Bone and Fish .....	8.00	3.29	4.00
Sure Crop Cotton-seed Meal Compound.....	8.00	3.29	4.00
Bowker's Red Oak Tobacco Fertilizer.....	8.00	2.47	7.00
Bowker's White Star Compound.....	8.00	2.47	4.00
Tobacco Fertilizer .....	8.00	2.47	3.00
Eureka Cotton Compound .....	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Excelsior C. S. M. Mixture.....	8.00	1.65	2.00
Empire Standard .....	8.00	1.65	2.00
Corn and Grain Grower .....	8.00	.82	4.00
Southern Special Compound .....	7.00	3.29	5.00
Bowker's 7 Per Cent Potato Guano.....	6.00	5.76	5.00
H. G. Top Dresser .....	....	7.41	3.00

*Boykin Chemical and Fertilizer Co., Baltimore, Md.—*

Boykin Top Dresser .....	....	7.41	3.00
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*H. P. Brown Guano Co., Salisbury, N. C.—*

Brown's Ground Rock Phosphate .....Total	28.00	....	....
Brown's 21½-4½ Bone Meal .....	21.05	3.70	....
Brown's 20-12 Bone and Potash.....	20.00	....	12.00
Brown's 20-8 Bone and Potash.....	20.00	....	8.00
Brown's Thomas Phosphate .....17.00 to	19.00	....	....
Brown's 16 Per Cent Acid Phosphate.....	16.00	....	....
Brown's 14 Per Cent Acid Phosphate.....	14.00	....	....
Brown's Dissolved Animal Bone .....	13.00	2.06	....
Brown's 13 Per Cent Acid Phosphate.....	13.00	....	....
Brown's 12-6 Bone and Potash.....	12.00	....	6.00
Brown's 12-5 Bone and Potash.....	12.00	....	5.00
Brown's 12-4 Bone and Potash.....	12.00	....	4.00
Brown's 12-3 Bone and Potash.....	12.00	....	3.00
Brown's 12 Per Cent Acid Phosphate.....	12.00	....	....
Brown's 11-5 Bone and Potash.....	11.00	....	5.00
Brown's 10-4-4 Guano .....	10.00	3.29	4.00
Brown's 10-3-3 Guano .....	10.00	2.47	3.00
Brown's 10-2-2 Guano .....	10.00	1.65	2.00
Brown's 10-1¼-6 Guano .....	10.00	1.03	6.00
Brown's 10-6 Bone and Potash.....	10.00	....	6.00
Brown's 10-5 Bone and Potash.....	10.00	....	5.00
Brown's 10-4 Bone and Potash.....	10.00	....	4.00
Brown's 10-3 Bone and Potash.....	10.00	....	3.00
Brown's 10-2 Bone and Potash.....	10.00	....	2.00
Brown's 9-3-3 Guano .....	9.00	2.47	3.00
Brown's 9-2¾-2 Guano .....	9.00	2.26	2.00
Brown's 9-2¼-4 Guano .....	9.00	1.85	4.00
Brown's 9-2-3 Guano .....	9.00	1.65	3.00
Brown's 9-1-3 Guano .....	9.00	.82	3.00
Brown's 8-4½-7 Guano .....	8.00	3.71	7.00
Brown's 8-4½-7 Tobacco Guano.....	8.00	3.71	7.00
Brown's 8-4-6 Guano .....	8.00	3.29	6.00
Brown's 8-4-6 Tobacco Guano .....	8.00	3.29	6.00
Brown's 8-4-4 Guano .....	8.00	3.29	4.00
Brown's 8-3-5 Guano .....	8.00	2.47	5.00
Brown's 8-3-5 Tobacco Guano .....	8.00	2.47	5.00
Brown's 8-3-3 Guano .....	8.00	2.47	3.00
Brown's 8-3-3 Tobacco Guano .....	8.00	2.47	3.00
Brown's 8-2½-3 Guano .....	8.00	2.06	3.00
Brown's 8-2½-3 Tobacco Guano .....	8.00	2.06	3.00
Brown's 8-2½-2 Guano .....	8.00	2.06	2.00
Brown's 8-2½-2 Tobacco Guano.....	8.00	2.06	2.00
Brown's 8-2-10 Guano .....	8.00	1.65	10.00
Brown's 8-2-3 Guano .....	8.00	1.65	3.00
Brown's 8-2-2 Guano .....	8.00	1.65	2.00
Brown's 8-2-2 Tobacco Guano .....	8.00	1.65	2.00
Brown's 8-1-4 Guano .....	8.00	.82	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Brown's 8-1-3 Guano .....	8.00	.82	3.00
Brown's 8-5 Bone and Potash.....	8.00	....	5.00
Brown's 8-4 Bone and Potash.....	8.00	....	4.00
Brown's 7-7-7 Guano .....	7.00	5.76	7.00
Brown's 7-5-8 Guano .....	7.00	4.12	8.00
Brown's 7-5-5 Guano .....	7.00	4.17	5.00
Brown's 7-4-5 Guano .....	7.00	3.29	5.00
Brown's 4-7½-2 Top Dresser .....	4.00	8.17	2.00
Brown's Fish Scrap .....	....	8.24	....
Brown's Nitrate of Soda .....	....	15.00	....
Brown's Dried Blood .....	....	13.00	....
Brown's 12 Per Cent Kainit.....	....	12.00	....
Brown's Top Dresser .....	....	7.40	3.00
Brown's Cotton-seed Meal .....	....	6.17	....
Brown's 7 Per Cent Tankage.....	....	5.76	....
Brown's Muriate of Potash .....	....	....	48.00
Brown's Sulphate of Potash .....	....	....	48.00

*C. J. Burton Guano Co., Baltimore, Md.—*

Burton's 16 Per Cent Acid Phosphate.....	16.00	....	....
Burton's 14 Per Cent Acid Phosphate.....	14.00	....	....
Burton's Alkaline .....	10.00	....	4.00
Burton's Potash Mixture .....	10.00	....	2.00
Burton's High Grade Tobacco .....	8.00	3.29	4.00
Burton's Best .....	8.00	2.47	3.00
Tobacco Queen .....	8.00	2.47	3.00
Burton High Grade .....	8.00	2.06	3.00
Burton's Butcher Bone .....	8.00	1.65	2.00

*Caraleigh Phosphate and Fertilizer Works,  
Raleigh, N. C.—*

Raw Bone Meal .....	Total	45.00	3.70	....
16 Per Cent Acid Phosphate.....		16.00	....	....
Climax Dissolved Bone .....		14.00	....	....
Sterling Acid Phosphate .....		13.00	....	....
Staple Acid Phosphate .....		12.00	....	....
Horne & Son's High Grade Bone and Potash.		11.00	....	5.00
Special Bone and Potash Mixture.....		10.00	....	4.00
Morris & Scarborough's Special Bone and Potash.		10.00	....	3.00
Electric Bone and Potash Mixture.....		10.00	....	2.00
Pacific Tobacco and Cotton Grower.....		9.00	2.26	2.00
Special 8-4-4 .....		8.00	3.39	4.00
Rhamkatte Special Tobacco Guano.....		8.00	3.29	6.00
Caraleigh Meal and Tankage Mixture.....		8.00	3.29	4.00
Horne's Best .....		8.00	2.47	3.00
Eclipse Ammoniated Guano .....		8.00	2.47	3.00
Caraleigh Formula for Tobacco.....		8.00	2.47	3.00
Planter's Pride .....		8.00	2.06	3.00
Caraleigh Special Tobacco Guano .....		8.00	2.06	3.00
Eli Ammoniated Fertilizer .....		8.00	1.65	2.00
Crown Ammoniated Guano .....		8.00	1.65	2.00
Comet Guano .....		8.00	.82	3.00
Buncombe Corn Grower .....		8.00	....	4.00
Buncombe Wheat Grower .....		8.00	....	4.00
Caraleigh Top Dresser .....		3.00	8.23	4.00
Nitrate of Soda .....		....	15.63	....
Dried Blood .....		....	13.16	....
Kanona Tankage .....		....	9.04	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Ground Fish .....	....	8.82	....
Sulphate of Potash .....	....	....	50.00
Muriate of Potash .....	....	....	50.00
Genuine German Kainit .....	....	....	12.00

*Carolina Union Fertilizer Co., Norfolk, Va.—*

Carolina Union Raw Bone Meal.....Total	21.00	3.71	....
Carolina Union 16 Per Cent.....	16.00	....	....
Carolina Union 14 Per Cent.....	14.00	....	....
Carolina Union 12-5 .....	12.00	....	5.00
Carolina Union 10-5 .....	10.00	....	5.00
Carolina Union 10-4 .....	10.00	....	4.00
Carolina Union 10-2 .....	10.00	....	2.00
Carolina Union 2½-9-4 Guano.....	9.00	1.85	4.00
Carolina Union 1-9-2 .....	9.00	.82	2.00
Carolina Union 4-8-4 .....	8.00	3.30	4.00
Carolina Union 3-8-3 .....	8.00	2.47	3.00
Carolina Union 2½-8-3 .....	8.00	2.06	3.00
Carolina 2-8-2 .....	8.00	1.65	2.00
Carolina Union 1-8-4 .....	8.00	.82	4.00
Carolina Union 10-2-2 .....	2.00	8.25	2.00
Nitrate of Soda .....	....	14.85	....
Muriate of Potash .....	....	....	50.00
Genuine German Kainit .....	....	....	12.00

*Catawba Fertilizer Co., Lancaster, S. C.—*

Catawba High Grade Acid Phosphate.....	16.00	....	....
Catawba High Grade Acid Phosphate.....	14.00	....	....
Catawba Acid and Potash .....	12.00	....	5.00
Catawba Acid and Potash .....	12.00	....	4.00
Catawba Special .....	10.00	3.20	4.00
Catawba Farmers' King .....	10.00	1.65	5.00
Catawba Climax .....	10.00	1.65	2.00
Catawba Preference .....	10.00	1.65	2.00
Catawba Grain King .....	10.00	.82	4.00
Catawba Acid and Potash.....	10.00	....	4.00
Catawba Acid and Potash.....	10.00	....	2.00
Catawba Gold Medal .....	9.00	2.47	7.00
Catawba Farmers' Special .....	9.00	2.47	2.00
Catawba Old Hickory .....	8.00	3.29	6.00
Catawba Regulator .....	8.00	3.29	4.00
Catawba Reliable .....	8.00	3.29	4.00
Catawba Electric .....	8.00	3.29	4.00
Catawba Farmers' Choice .....	8.00	2.47	5.00
Catawba Red Rose .....	8.00	2.47	3.00
Catawba Peerless .....	8.00	2.47	3.00
Catawba Red Star .....	8.00	2.47	3.00
Catawba Champion .....	8.00	2.05	3.00
Catawba Standard Formula .....	8.00	2.05	3.00
Catawba Standard .....	8.00	2.05	2.00
Catawba Eclipse .....	8.00	1.65	2.00
Catawba Economizer .....	8.00	1.65	2.00
Catawba Dixie .....	8.00	1.65	2.00
Catawba Acid and Potash.....	8.00	....	4.00
Catawba Cotton Producer .....	6.00	4.93	5.00
Catawba H. G. Top Dresser.....	4.00	6.16	2.50
Catawba Superior .....	4.00	5.75	7.00
Catawba Excelsior .....	4.00	5.75	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Catawba Nitrate of Soda .....	....	15.00	....
Catawba Muriate of Potash.....	....	....	48.00
Catawba Kainit .....	....	....	12.00

*Central Phosphate Co., Mount Pleasant, Tenn.—*

Tennessee Phosphate .....	Total	32.00	....	....
Tennessee Phosphate .....	Total	28.00	....	....

*Chatham Oil and Fertilizer Co., Pittsboro, N. C.—*

C. O. & F. Co. Acid Phosphate.....	16.00	....	....
C. O. & F. Co. Acid Phosphate.....	14.00	....	....
C. O. & F. Co. Bone and Potash.....	10.00	....	5.00
C. O. & F. Co. Bone and Potash.....	10.00	....	2.00
Chatham Corn Grower .....	9.00	1.23	3.00
Pittsboro High Grade .....	8.00	3.30	4.00
High Land Tobacco Grower.....	8.00	2.47	3.00
Pride of Chatham .....	8.00	2.47	3.00
London's Special .....	8.00	2.47	3.00
Chatham Cotton Grower .....	8.00	1.65	2.00
C. O. & F. Co. German Kainit.....	....	....	12.00

*The Chesapeake Chemical Co., Baltimore, Md.—*

C. C. Co.'s Dissolved Phosphate 16 Per Cent..	16.00	....	....
C. C. Co.'s Dissolved Phosphate 14 Per Cent..	14.00	....	....
C. C. Co.'s Reliable Phosphate.....	10.00	....	4.00
C. C. Co.'s Celebrated Mixture.....	10.00	....	2.00
C. C. Co.'s High Grade Guano.....	8.00	3.28	4.00
C. C. Co.'s Excelsior Fertilizer.....	8.00	2.46	4.00
C. C. Co.'s Fish Guano.....	8.00	2.46	3.00
C. C. Co.'s Ammoniated Phosphate.....	8.00	1.64	3.00
C. C. Co.'s National Crop Grower.....	8.00	1.64	2.00
C. C. Co.'s Keystone Phosphate.....	7.00	3.28	5.00
C. C. Co.'s Potato Compound.....	6.00	4.10	5.00
C. C. Co.'s Prolific Top Dresser.....	....	7.51	3.50
C. C. Co.'s German Kainit.....	....	....	12.40

*City Abattoir of Winston-Salem, Winston-Salem, N. C.—*

Tankage .....	8.50	5.74	....
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*Clayton Oil Mill, Clayton, N. C.—*

C. O. M. 16 Per Cent Acid Phosphate.....	16.00	....	....
C. O. M. High Grade Bone and Potash.....	12.00	....	5.00
C. O. M. Wheat Compound.....	10.00	2.05	4.50
C. O. M. Bone and Potash.....	10.00	....	5.00
R. B. W. Special .....	9.00	3.30	4.00
Austin's Special .....	9.00	2.47	3.00
Wayside Special .....	9.00	1.65	4.00
C. W. H. Special .....	8.00	5.00	5.00
C. O. M. Cotton Grower.....	8.00	3.30	4.00
Clayton Guano .....	8.00	2.47	3.00
Planters' Favorite .....	8.00	2.47	3.00
Clayton Sec. Tobacco Grower .....	8.00	2.47	3.00
Cotton Queen .....	8.00	1.65	2.00
Summer Queen .....	8.00	1.65	2.00
C. O. M. Top Dresser.....	3.00	7.75	2.00
C. O. M. German Kainit.....	....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
<i>The Coe-Mortimer Co., Charleston, S. C.—</i>			
Gen. Key—Tree Brand Thomas Phosphate, Total .....	18.00	....	....
Gen. Key—Tree Brand Thomas Phosphate, Total .....	17.50	....	....
Coe-Mortimer Co.'s Dissolved Bone .....	16.00	....	....
Coe-Mortimer Co.'s Dissolved Bone .....	14.00	....	....
Coe-Mortimer Co.'s Level Best .....	10.00	3.29	4.00
Coe-Mortimer Co.'s Progressive Farmer.....	10.00	2.47	3.00
Coe-Mortimer Co.'s Bone and Potash.....	10.00	....	4.00
Coe-Mortimer Co.'s Bone and Potash.....	10.00	....	2.00
Coe-Mortimer Co.'s Corn Club .....	9.25	2.05	2.00
Carolina Special .....	9.00	2.47	3.00
Coe-Mortimer Co.'s Excelsior .....	9.00	2.05	4.00
Coe-Mortimer Co.'s M. H. G.....	9.00	1.65	3.00
Knickerbocker Standard .....	9.00	1.65	2.00
Coe-Mortimer Co.'s Tar Heel .....	9.00	.82	3.00
Coe-Mortimer Co.'s Special Formula.....	8.50	1.65	2.00
High Grade Tankage .....	8.00	7.81	9.50
E. Frank Co.'s Extra High Grade.....	8.00	4.11	7.00
Marcoe Guano .....	8.00	3.29	4.00
C.-M. Co.'s Tobacco Grower.....	8.00	3.28	4.00
Coe-Mortimer Co.'s Tobacco Fertilizer, No. 3.	8.00	2.47	6.00
Coe-Mortimer Co.'s Tobacco Fertilizer, No. 2.	8.00	2.47	5.00
Coe-Mortimer Co.'s Tobacco Fertilizer, No. 1.	8.00	2.47	4.00
Coe-Mortimer Co.'s Meal Mixture .....	8.00	2.47	4.00
C.-M. Co.'s Tobacco Special.....	8.00	2.47	3.00
Darlington Guano .....	8.00	2.47	3.00
Coe-Mortimer Co.'s Cotton and Corn.....	8.00	2.05	3.00
Coe-Mortimer Co.'s General Crop .....	8.00	2.05	2.00
Coe-Mortimer Co.'s Standard .....	8.00	2.05	1.00
Coe-Mortimer Co.'s Straight Goods .....	8.00	1.65	3.00
Universal .....	8.00	1.65	2.00
Coe-Mortimer Co.'s Bone and Potash.....	8.00	....	4.00
Mortimer's High Grade .....	7.00	4.11	5.00
Imported Fish Guano .....	5.80	8.22	10.00
Coe-Mortimer Co.'s Top Dresser .....	4.00	6.17	2.50
H. G. Blood .....	....	13.37	16.25
Nitrate of Soda .....	....	14.83	....
Muriate of Potash .....	....	....	49.00
Sulphate of Potash .....	....	....	49.00
Muriate Mixture .....	....	....	20.00
Genuine German Kainit .....	....	....	12.00
<i>Columbia Guano Co., Norfolk, Va.—</i>			
Pure Raw Bone Meal .....	Total 21.50	3.71	....
Columbia Thomas Phosphate .....	18.00	....	....
Columbia High Grade 16 Per Cent Acid Phos- phate .....	16.00	....	....
Columbia 14 Per Cent Acid Phosphate.....	14.00	....	....
Columbia Dissolved Bone .....	13.00	....	....
Columbia 12 and 6 Bone and Potash Mixture.	12.00	....	6.00
Columbia 12 and 5 Bone and Potash.....	12.00	....	5.00
Columbia 12 and 5 B. and P. Mixture.....	12.00	....	5.00
Columbia Acid Phosphate .....	12.00	....	....
Columbia 11 and 5 Bone and Potash Mixture.	11.00	....	5.00
Columbia 10½ and 1½ Bone and Potash Mix- ture .....	10.50	....	1.50

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Columbia 10 and 5 Bone and Potash Mixture.	10.00	....	5.00
Columbia 10 and 4 Bone and Potash Mixture.	10.00	....	4.00
Columbia Bone and Potash for Grain.....	10.00	....	3.00
Columbia Bone and Potash Mixture.....	10.00	....	2.00
Columbia C. S. M. Special.....	9.00	2.27	2.00
Parrish's Special .....	9.00	2.06	5.00
Roanoke Ammoniated Guano .....	9.00	1.65	3.00
Carolina Soluble Guano .....	9.00	1.65	1.00
Columbia Grain Guano .....	9.00	.82	3.00
Columbia Special 1-9-2 Guano.....	9.00	.82	2.00
Columbia Special Truck .....	8.00	4.12	5.00
Tobacco King .....	8.00	3.30	5.00
Pelican Ammoniated Guano .....	8.00	3.30	4.00
Columbia Special Truck Guano.....	8.00	8.30	4.00
Trojan Tobacco Guano .....	8.00	3.30	4.00
Columbia Special 4-8-3 .....	8.00	3.30	3.00
Yelverton Bros.' Plant Food for Tobacco....	8.00	2.47	5.00
Columbia S-3-4 Special Guano.....	8.00	2.47	4.00
Olympia Cotton Guano .....	8.00	2.47	3.00
Hycro Tobacco Guano .....	8.00	2.47	3.00
Our Best Meal Guano.....	8.00	2.47	3.00
Royal Tobacco Fertilizer .....	8.00	2.06	3.00
Columbia Special Tobacco Guano.....	8.00	2.06	2.00
Columbia S-2-5 Tobacco Special.....	8.00	1.65	5.00
Columbia Fish and Blood Guano.....	8.00	1.65	4.00
Columbia Fish Phosphate and Potash.....	8.00	1.65	4.00
Columbia Fish Phosphate and Potash.....	8.00	1.65	3.00
Columbia Soluble Guano for Tobacco.....	8.00	1.65	2.00
Columbia Special Wheat Fertilizer.....	8.00	1.65	2.00
Columbia Soluble Guano .....	8.00	1.65	2.00
Spinola Peanut Grower .....	8.00	1.02	4.00
Columbia 8 and 4 Bone and Potash Mixture..	8.00	....	4.00
Columbia Special 7 Per Cent Truck Guano...	7.00	5.77	7.00
Columbia Potato Manure .....	7.00	4.12	7.00
Columbia Potato Guano .....	7.00	4.12	5.00
Crown Brand Peanut Guano.....	7.00	....	5.00
Columbia Irish Potato Grower.....	6.00	4.12	7.00
Perfection Potato Producer .....	5.00	4.94	7.00
Columbia Side Dresser .....	4.00	8.22	4.00
Columbia Special Top Dresser .....	4.00	6.18	2.50
Columbia Top Dresser .....	....	7.42	3.00
Nitrate of Soda .....	....	15.22	....
Cotton-seed Meal .....	....	6.17	....
Sulphate of Potash .....	....	....	48.00
Muriate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00

*Combahee Fertilizer Co., Charleston, S. C.—*

C. F. Co. Dissolved Bone.....	16.00	....	....
C. F. Co. Dissolved Bone.....	14.00	....	....
C. F. Pure Dissolved Bone.....	13.00	....	....
C. F. Co. Melon Fertilizer.....	10.00	3.30	5.00
C. F. Co. Cantaloupe Fertilizer.....	10.00	2.47	10.00
Acid with Potash .....	10.00	....	2.00
Special Mixture .....	9.00	1.65	2.00
C. F. Co. K. M. S. ....	8.00	3.30	4.00
C. F. Co. H. G. Cotton Mixture.....	8.00	2.47	3.00
C. F. Co. Cotton and Corn Compound.....	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Nitrate of Soda .....	....	14.83	....
Muriate of Potash .....	....	....	48.00
Kainit .....	....	....	12.00

*Conestee Chemical Co., Wilmington, N. C.—*

16 Per Cent Acid Phosphate .....	16.00	....	....
Conestee High Grade Acid Phosphate.....	14.00	....	....
Conestee Bone and Potash.....	12.00	....	6.00
Conestee Bone and Potash.....	12.00	....	5.00
Conestee Bone and Potash.....	12.00	....	4.00
Conestee Bone and Potash.....	12.00	....	3.00
Conestee Bone and Potash.....	12.00	....	2.00
Conestee Bone and Potash.....	11.00	....	6.00
Conestee Bone and Potash.....	11.00	....	5.00
Conestee Bone and Potash.....	11.00	....	4.00
Conestee Bone and Potash.....	11.00	....	3.00
Conestee Bone and Potash.....	11.00	....	2.00
Conestee Bone and Potash.....	10.00	....	6.00
Conestee Bone and Potash.....	10.00	....	5.00
Conestee Bone and Potash.....	10.00	....	4.00
Conestee Bone and Potash.....	10.00	....	3.00
Conestee Bone and Potash.....	10.00	....	2.00
Conestee Square Deal Fertilizer for Tobacco.	9.25	1.65	2.00
Conestee Square Deal Fertilizer .....	9.25	1.65	2.00
Adams' Special Fertilizer .....	9.00	2.47	3.00
Conestee Cotton Grower .....	9.00	2.27	2.00
Conestee Premo Guano .....	9.00	.82	3.00
Conestee Special Fertilizer for Cotton.....	8.00	4.12	7.00
Conestee Melon Grower .....	8.00	4.12	7.00
Conestee Special Fertilizer for Tobacco.....	8.00	4.12	7.00
Conestee O. K. Fertilizer for Tobacco.....	8.00	3.30	4.00
Conestee P. D. Q. Fertilizer.....	8.00	3.30	4.00
Conestee "O. K." Fertilizer .....	8.00	3.30	4.00
Conestee P. D. Q. Fertilizer for Tobacco.....	8.00	3.30	4.00
Conestee Plumb Good Fertilizer.....	8.00	2.47	4.00
Conestee Crop Grower for Tobacco.....	8.00	2.47	4.00
Conestee Fish Scrap Guano for Tobacco.....	8.00	2.47	3.00
Conestee 8-3-3 C. S. M. Guano.....	8.00	2.47	3.00
Conestee 8-3-3 C. S. M. Guano for Tobacco...	8.00	2.47	3.00
Conestee Fish Scrap Guano.....	8.00	2.47	3.00
Conestee Special Fertilizer .....	8.00	2.47	3.00
Conestee Special Tobacco Fertilizer.....	8.00	2.47	3.00
Conestee Fertilizer for Tobacco .....	8.00	2.47	2.50
Conestee Fertilizer .....	8.00	2.47	2.50
Conestee Crop Grower .....	8.00	2.06	3.00
Conestee Tobacco Grower .....	8.00	2.06	3.00
Conestee Complete Fertilizer .....	8.00	2.06	2.00
Conestee Special Grain Fertilizer .....	8.00	1.65	2.00
Conestee Standard Guano for Tobacco.....	8.00	1.65	2.00
Conestee Standard Guano .....	8.00	1.65	2.00
Cotton-seed Meal Guano for Tobacco.....	8.00	1.65	2.00
Cotton-seed Meal Guano .....	8.00	1.65	2.00
Conestee Bone and Potash.....	8.00	....	6.00
Conestee Bone and Potash.....	8.00	....	5.00
Conestee Bone and Potash.....	8.00	....	4.00
Conestee Root Crop Guano.....	7.00	4.12	7.00
Conestee Standard Truck Guano.....	7.00	4.12	5.00
Conestee High Grade Guano.....	6.00	4.94	8.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Conestee Truck Grower .....	6.00	3.30	8.00
Conestee Corn Guano .....	6.00	2.47	3.00
Dried Ground Fish .....	4.50	7.81	....
Conestee Special Top Dresser.....	4.00	8.25	4.00
Sulphate of Ammonia .....	....	20.56	....
Nitrate of Soda .....	....	14.81	....
Dried Ground Blood .....	....	11.51	....
Conestee Top Dresser .....	....	7.40	3.00
Cotton-seed Meal .....	....	6.17	....
Muriate of Potash .....	....	....	48.00
Sulphate of Potash .....	....	....	48.00
H. G. German Kainit 16 Per Cent.....	....	....	16.00
Genuine German Kainit .....	....	....	12.00

*Contentnea Guano Co., Wilson, N. C.—*

High Grade 16 Per Cent Acid.....	16.00	....	....
Contentnea 14 Per Cent Acid.....	14.00	....	....
"Corn Club" Special .....	10.00	.82	5.00
Bone and Potash Mixture, No. 3.....	10.00	....	5.00
Bone and Potash Mixture, No. 2.....	10.00	....	4.00
Bone and Potash Mixture, No. 1.....	10.00	....	2.00
Contentnea Cotton Formula .....	9.00	2.25	2.00
Bartholomew's Cotton Grower .....	9.00	1.85	5.00
S-4½-7 for Tobacco .....	8.00	3.70	7.00
S-4½-7 for Cotton .....	8.00	3.70	7.00
Climax High Grade .....	8.00	3.30	4.00
Climax H. G. for Cotton.....	8.00	3.30	4.00
Carr Tobacco Grower .....	8.00	2.90	6.00
High Grade Tobacco Grower.....	8.00	2.90	5.00
Government Formula, No. 1.....	8.00	2.47	10.00
Government Formula, No. 2.....	8.00	2.47	7.00
Victor Tobacco Grower .....	8.00	2.47	5.00
Farmers' Favorite Tobacco Grower.....	8.00	2.47	4.00
Plant-bed Tobacco Grower .....	8.00	2.47	3.00
Pick Leaf Tobacco Fertilizer.....	8.00	2.47	3.00
Top Notch Fertilizer .....	8.00	2.47	3.00
Matchless Cotton Grower .....	8.00	2.47	3.00
Contentnea Cotton Grower .....	8.00	2.47	2.50
Bragg Cotton Grower .....	8.00	2.05	3.00
Blood and Bone Cotton Grower.....	8.00	1.65	2.00
Bragg Corn Grower .....	8.00	.82	5.00
Contentnea Corn Special .....	5.00	1.65	5.00
High Grade Top Dresser .....	4.00	8.25	4.00
Contentnea Top Dresser .....	3.00	8.25	5.00
Nitrate of Soda .....	....	14.82	....
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	50.00
Manure Salts .....	....	....	20.00
H. G. 16 Per Cent German Kainit.....	....	....	16.00
German Kainit .....	....	....	12.00

*Cooper Guano Co., Wilmington, N. C.—*

Cooper's 4½ Per Cent Raw Bone Meal.....	22.50	3.71	....
Cooper's Acid with Potash.....	10.00	....	5.00
Cooper's Zenith .....	8.00	2.00	3.00
Cooper's High Grade .....	7.00	6.00	5.00

*Coöperative Warehouse Co., Salisbury, N. C.—*

Farmers' Union Cotton-seed Meal.....	....	6.17	....
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Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
<i>Coweta Fertilizer Co., Norfolk, Va.—</i>			
Coweta 16 Per Cent Acid Phosphate.....	16.00	....	....
Coweta High Grade Acid Phosphate.....	14.00	....	....
Coweta Acid Phosphate .....	13.00	....	....
Coweta Fish Guano .....	10.00	1.65	2.00
Coweta Standard Bone and Potash.....	10.00	....	4.00
Coweta Dissolved Bone and Potash.....	10.00	....	2.00
Coweta Nonpareil Grower .....	9.00	.83	3.00
Coweta Animal Bone .....	8.00	3.29	4.00
Sea Bird Standard Guano .....	8.00	2.47	3.00
Coweta Perfection Tobacco Grower.....	8.00	2.47	3.00
Coweta Royal Guano .....	8.00	2.06	3.00
Coweta Beef Blood and Bone .....	8.00	2.06	1.00
Coweta Success Guano .....	8.00	1.65	2.00
Coweta Special Bone and Potash.....	8.00	....	4.00
Coweta Standard Truck Guano .....	6.00	4.12	7.00
Nitrate of Soda .....	....	14.83	....
Cotton-seed Meal .....	....	6.17	....
Muriate of Potash .....	....	....	49.00
Genuine German Kainit .....	....	....	12.00

*Craven Chemical Co., New Bern, N. C.—*

Panama 16 Per Cent Phosphate.....	16.00	....	....
Jewel Acid Phosphate .....	14.00	....	....
Turkey Trot Bone and Potash.....	12.00	....	6.00
Herring's Bone and Potash .....	12.00	....	5.00
Craven H. G. Bone and Potash.....	12.00	....	4.00
Foy's H. G. Bone and Potash Mixture.....	10.00	....	6.00
Craven Grain Compound .....	10.00	....	4.00
Trent Bone and Potash .....	10.00	....	2.00
Halifax Guano .....	9.00	2.47	3.00
Prolix 9-2-3 Special Guano .....	9.00	1.65	3.00
Hanover Standard Guano .....	8.00	3.29	4.00
Currituck Sweet Potato Guano .....	8.00	2.47	6.00
Duplin Tobacco Guano .....	8.00	2.47	3.00
Gaston High Grade Fertilizer.....	8.00	2.47	3.00
C. E. Foy High Grade Guano.....	8.00	2.47	3.00
C. C. Co. Standard Tobacco Guano.....	8.00	2.47	3.00
Hart's Special Tobacco Grower.....	8.00	2.47	3.00
Marvel Great Crop Grower .....	8.00	2.06	3.00
Elite Cotton Guano .....	8.00	1.65	2.00
Pantego Potato Guano .....	7.00	4.12	7.00
Neuse Truck Grower .....	6.00	4.94	6.00
Craven Chemical Co.'s Truck Guano, 5-10-2½.	5.00	8.24	2.50
Craven Chemical Co.'s Top Dresser A.....	4.00	8.24	4.00
Craven Chemical Co.'s Top Dresser B.....	4.00	6.18	2.50
Craven Chemical Co.'s Top Dresser C.....	....	7.41	3.00
Genuine German Kainit .....	....	....	12.00

*Dey & Brother, Beaufort, N. C.—*

Ground Fish Scrap .....	7.00	8.23	....
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*Dixie Guano Co., Durham, N. C.—*

Dixie 16 Per Cent Acid Phosphate.....	16.00	....	....
Dixie 14 Per Cent Acid Phosphate.....	14.00	....	....
Dixie Champion for Wheat and Corn.....	10.50	....	1.50
Jeff Davis Special .....	9.00	2.26	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Dixie Star Ammoniated .....	9.00	1.65	2.00
Dixie Corn Fertilizer .....	9.00	.82	3.00
Radium Brand Guano .....	8.00	3.28	5.00
Dixie Tobacco Fertilizer .....	8.00	2.46	3.00
Carolina Special Ammoniated .....	8.00	2.46	3.00
Sulky Plow Brand Guano.....	8.00	2.46	2.00
Battle's Blood and Bone Fertilizer.....	8.00	2.05	3.00
Niagara Soluble Bone .....	8.00	2.05	2.00
Dixie Cotton Fertilizer .....	8.00	1.65	2.00
Old Plantation Superphosphate .....	8.00	1.65	2.00
Nitrate of Soda .....	....	14.82	....
Sulphate of Potash .....	....	....	49.00
Muriate of Potash .....	....	....	48.00
Kainit .....	....	....	12.00
Dixie Prepared Agricultural Lime.....	....	....	2.50

*Dixie Guano Co., Inc., Suffolk, Va.—*

Dixie Acid Phosphate .....	16.00	....	....
Dixie Acid Phosphate .....	14.00	....	....
Dixie Goodluck Brand .....	12.00	1.00	6.00
Dixie Alkaline Bone and Potash.....	11.00	....	2.00
Dixie Monticello Brand .....	10.00	1.00	2.00
Dixie Alkaline Bone and Potash.....	10.00	....	4.00
Dixie Alkaline Bone and Potash.....	10.00	....	2.00
Dixie's Best .....	8.00	4.11	7.00
Dixie S-4-4 Guano .....	8.00	3.29	4.00
Dixie Maximum Brand .....	8.00	2.47	4.00
Dixie High Grade .....	8.00	2.47	3.00
Dixie S-2-5 Guano .....	8.00	1.65	5.00
Dixie Standard Guano .....	8.00	1.65	2.00
Dixie Bonus Brand .....	8.00	1.65	2.00
Dixie Jumbo Peanut Grower.....	8.00	1.00	4.00
Dixie 5 Per Cent Truck .....	7.00	4.11	5.00
Dixie Potato Guano .....	6.00	5.75	5.00
Dixie 10 Per Cent Top Dresser.....	5.00	8.23	3.00
Dixie 7 Per Cent Guano.....	5.00	5.66	4.00
Nitrate of Soda .....	....	15.21	....
Ground Fish .....	....	8.23	....
Cotton-seed Meal .....	....	6.16	....
Muriate of Potash .....	....	....	48.00
Kainit .....	....	....	12.00

*Eastern Cotton Oil Co., Hertford, N. C.—*

Acid Phosphate .....	16.00	....	....
"Ten-One-Four for Peanuts" .....	10.00	.83	4.00
Currituck Special for Yellow Sweets.....	8.00	3.29	6.00
Mat White Special .....	8.00	3.29	4.00
It-grows Currituck Yellows .....	8.00	2.47	3.00
Rain-proof Cotton Grower .....	8.00	2.47	3.00
Fish and Blood Mixture.....	8.00	1.65	2.00
Perquimans Favorite .....	8.00	1.65	2.00
Early Bird .....	7.00	4.12	5.00
Hertford Truck Grower .....	6.00	5.77	5.00
Tankage and Fish Substitute Peruvian Guano for Truck .....	6.00	4.12	7.00
Nun-such Potato Grower .....	6.00	4.12	7.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
<i>Elmore Gin and Fertilizer Co., Elmore, N. C.—</i>			
Elmore Standard Fertilizer .....	8.00	3.29	4.00
Elmore Cotton Fertilizer .....	8.00	2.47	3.00
Elmore X Fertilizer .....	6.50	2.47	2.50
Elmore Cantaloupe Special .....	7.00	4.00	7.50
Elmore Top Dresser .....	....	8.65	3.50
Elmore Money Maker Top Dresser.....	....	7.41	6.00
Elmore Corn Fertilizer .....	....	3.70	7.50
<i>Etiwan Fertilizer Co., Charleston, S. C.—</i>			
Etiwan 16 Per Cent Acid Phosphate.....	16.00	....	....
Etiwan High Grade Acid Phosphate.....	14.00	....	....
Etiwan Dissolved Bone .....	13.00	....	....
Diamond Soluble Bone .....	13.00	....	....
Etiwan Acid Phosphate with Potash.....	11.00	....	1.00
Plow Brand Acid Phosphate with Potash....	11.00	....	1.00
Etiwan Potash Bone .....	10.00	....	4.00
Etiwan Soluble Bone with Potash.....	10.00	....	3.00
Diamond Soluble Bone with Potash.....	10.00	....	2.00
XX Acid Phosphate with Potash.....	10.00	....	2.00
Etiwan Blood and Bone Guano.....	9.00	2.06	1.00
Plow Brand Raw Bone Superphosphate.....	9.00	2.06	1.00
Etiwan 9-2-3 Per Cent Ammoniated Fertilizer.	9.00	1.65	3.00
Plow Brand Ammoniated Dissolved Bone....	9.00	1.65	2.00
Etiwan Superior Cotton Fertilizer.....	8.00	3.30	6.00
Etiwan Special Cotton Fertilizer.....	8.00	3.30	4.00
Plow Brand Special Tobacco Fertilizer.....	8.00	3.30	4.00
Etiwan Cotton Compound .....	8.00	2.47	3.00
Etiwan High Grade Cotton Fertilizer.....	8.00	2.47	2.00
Etiwan Ammoniated Fertilizer .....	8.00	1.65	2.00
Plow Brand Ammoniated Fertilizer.....	8.00	1.65	2.00
Etiwan Special Potash Mixture.....	8.00	....	4.00
Nitrate of Soda .....	....	14.82	....
Muriate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00
<i>Farmers Coöperative Fertilizer Co., Inc., Blackstone and Kenbridge, Va.—</i>			
Pure Animal Bone .....	21.00	2.47	....
F. C. F. Co.'s Acid Phosphate.....	16.00	....	....
F. C. F. Co.'s Acid Phosphate.....	14.00	....	....
Sampson .....	10.00	2.47	5.00
Pape's Peerless .....	10.00	1.64	2.00
Cherokee .....	10.00	1.03	....
F. C. F. Co.'s Bone and Potash Compound...	10.00	....	4.00
F. C. F. Co.'s Bone and Potash Compound...	10.00	....	2.00
Walkover .....	9.00	1.03	1.00
Virginian .....	8.00	3.99	2.00
Virginian X .....	8.00	3.29	4.00
Meherrin .....	8.00	2.47	3.00
Nottoway Special .....	8.00	2.47	2.00
Free State Official .....	8.00	2.06	3.00
Paul Jones .....	8.00	1.64	2.00
<i>Farmers Cotton Oil Co., Wilson, N. C.—</i>			
16 Per Cent Acid Phosphate .....	16.00	....	....
Bonum Acid Phosphate .....	14.00	....	....
Contentnea Acid Phosphate .....	13.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Washington's Corn Mixture Guano.....	10.00	1.65	5.00
Xtra Good Bone and Potash.....	10.00	....	2.00
Whitley's Special Guano .....	9.00	3.30	4.00
Dean's Special Guano .....	8.00	3.70	7.00
Regal Tobacco Guano .....	8.00	2.88	5.00
Newsome's Tobacco Special .....	8.00	2.47	4.00
Graves' Cotton Grower Guano.....	8.00	2.47	3.00
Golden Gem Guano .....	8.00	2.47	3.00
Wilson High Grade Guano .....	8.00	2.27	2.00
Planters' Friend Guano .....	8.00	2.06	3.00
Carolina Choice Tobacco Guano.....	8.00	2.06	3.00
Crop King Guano .....	8.00	1.65	2.00
Farmers' Special Guano .....	8.00	1.65	2.00
Rogers' Truck Grower .....	7.00	5.76	7.00
Wilson Top Dresser .....	2.00	9.05	4.00
Perfect Top Dresser .....	2.00	8.23	5.00
Sulphate of Ammonia .....	....	20.57	....
Nitrate of Soda .....	....	15.63	....
Nitrate Special .....	....	10.66	4.00
Tomlinson's Nitrate Special .....	....	9.87	5.00
Sulphate of Potash .....	....	....	50.00
Muriate of Potash .....	....	....	50.00
German Kainit .....	....	....	12.00

*Farmers Guano Co., Raleigh, N. C., and Norfolk, Va.—*

Raw Bone Meal .....	Total	45.00	3.70	....
16 Per Cent Acid Phosphate.....		16.00	....	....
14 Per Cent Acid Phosphate.....		14.00	....	....
Farmers Acid Phosphate .....		13.00	....	....
Special H. G. Bone and Potash.....		11.00	....	5.00
Farmers Grain Grower .....		10.00	1.03	2.00
Special Bone and Potash Mixture.....		10.00	....	4.00
Century Bone and Potash Mixture.....		10.00	....	2.00
Farmers Meal and Tankage Mixture.....		8.00	3.29	4.00
Farmers Blood and Bone .....		8.00	3.29	4.00
Big Crop Guano .....		8.00	2.88	5.00
Farmers Formula for Tobacco .....		8.00	2.47	3.00
Money Point Guano .....		8.00	2.47	3.00
Golden Grade Guano .....		8.00	2.47	3.00
Toco Tobacco Guano .....		8.00	2.06	3.00
Farmers 8-2-5 Guano .....		8.00	1.65	5.00
Farmers Ammoniated Guano .....		8.00	1.65	2.00
State Standard Guano .....		8.00	1.65	2.00
Farmers Peanut Guano .....		8.00	1.03	4.00
Special Bone and Potash.....		8.00	....	4.00
Farmers 7-7-7 Per Cent Trucker.....		7.00	5.76	7.00
Farmers 7-5-8 Special .....		7.00	4.12	8.00
Farmers Challenge .....		7.00	4.12	5.00
Farmers 6-7-5 Trucker .....		6.00	5.76	5.00
Farmers Top Dresser .....		3.00	8.23	4.00
Nitrate of Soda .....		....	15.63	....
Kanona Tankage .....		....	9.04	....
Muriate of Potash .....		....	....	50.00
Sulphate of Potash .....		....	....	50.00
Genuine German Kainit .....		....	....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
<i>Farmers Guano Works, Dillard, Ga.—</i>			
High Grade Dissolved Acid 16 Per Cent.....	16.00	....	....
High Grade Compost Mixture.....	13.00	....	7.00
High Grade Corn Grower.....	12.00	.82	5.00
Special for Wheat .....	12.00	....	5.00
Mack's Special Double Potash Formula.....	11.00	1.65	6.00
Special for Corn .....	10.00	1.65	4.00
Small Grain Compound .....	10.00	....	4.00
Special Mixture for Potatoes.....	8.00	.82	7.00
High Grade Vegetable Compound.....	8.00	....	6.00
Oats Special Mixture .....	8.00	....	5.00
Nitrate of Soda .....	....	15.00	....
Sulphate Potash .....	....	....	50.00
Muriate Potash .....	....	....	50.00
<i>Farmville Oil and Fertilizer Co., Farmville, N. C.—</i>			
Chamblee & Sons H. G. for Tobacco.....	8.00	2.47	5.00
<i>Federal Chemical Co., Columbia, Tenn.—</i>			
Tennessee Brown Phosphate Rock.....Total	29¾	....	....
<i>Fremont Oil Mills, Fremont, N. C.—</i>			
16 Per Cent Acid Phosphate.....	16.00	....	....
Fremont High Grade Bone and Potash.....	10.00	....	4.00
S. H. & Co.'s 8-4-4.....	8.00	3.29	4.00
Fremont High Grade Guano.....	8.00	3.29	4.00
8-3-5 Compound .....	8.00	2.47	5.00
Fremont Oil Mill Co.'s Special Tobacco.....	8.00	2.47	5.00
Nahunta Special .....	8.00	2.47	3.00
S. H. & Co.'s 8-3-3.....	8.00	2.47	3.00
Square Deal .....	8.00	2.05	3.00
Up-to-date .....	8.00	1.65	2.00
F. O. M. Co. Top Dresser.....	3.00	7.40	5.00
Nitrate of Soda .....	....	14.85	....
Muriate of Potash .....	....	....	48.00
Sulphate of Potash .....	....	....	48.00
Kainit .....	....	....	12.00
<i>General Manufacturing Co., Norfolk, Va.—</i>			
Acid Phosphate .....	16.00	....	....
Acid Phosphate .....	14.00	....	....
Potash and Soluble Bone.....	12.00	....	5.00
Potash and Soluble Bone.....	12.00	....	3.00
Potash and Soluble Bone.....	10.00	....	5.00
Potash and Soluble Bone.....	10.00	....	4.00
Potash and Soluble Bone.....	10.00	....	2.00
H. G. Cotton and Tobacco Guano.....	8.00	3.28	4.00
Manure Substitute.....	8.00	3.28	4.00
Organic Cotton Grower .....	8.00	2.46	3.00
Big Crop Grower .....	8.00	1.65	2.00
Special Peanut Grower .....	8.00	1.03	4.00
Royal Crop Grower .....	8.00	1.03	4.00
Special Peanut Grower .....	8.00	1.00	4.00
Royal Crop Grower .....	8.00	1.00	4.00
Blood, Bone and Potash.....	7.00	4.10	8.00
Special 7 Per Cent Trucker.....	6.00	5.74	5.00
Special Potato Grower .....	6.00	4.10	7.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Virginia Trucker .....	6.00	3.38	4.00
Nitrate of Soda .....	....	15.23	....
Muriate of Potash .....	....	....	50.00
Kainit .....	....	....	12.00

*General Manufacturing Co., Norfolk, Va., and New  
Bern, N. C.—*

Acid .....	....	....	....
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*Georgia Chemical Works, Augusta, Ga.—*

High Grade Dissolved Bone Phosphate.....	16.00	....	....
Extra Dissolved Bone Phosphate.....	14.00	....	....
Dissolved Bone Phosphate .....	13.00	....	....
Georgia Bone and Potash.....	12.00	....	6.00
12 Per Cent Dissolved Bone Phosphate .....	12.00	....	....
High Grade XX Acid Phosphate with Potash.	10.00	....	4.00
Bone and Potash .....	10.00	....	2.00
Carolina Special Cotton Grower.....	9.00	2.47	4.00
Mascot Blood and Bone Guano.....	9.00	2.47	3.00
Bumper Tobacco Grower .....	9.00	1.85	4.00
Good as Gold Guano.....	9.00	1.65	3.00
Gem Crop Grower .....	9.00	1.65	2.00
Georgia Belle Compound .....	9.00	.82	2.00
Cardinal High Grade .....	8.00	3.29	4.00
Intensive Formula .....	8.00	2.47	3.00
Golden Leaf Special Tobacco Compound.....	8.00	2.47	3.00
Three Oaks High Grade Guano.....	8.00	2.47	2.00
Thunderbolt Tobacco Special .....	8.00	2.06	3.00
Georgia Formula .....	8.00	1.65	2.00
XXX Meal Mixture .....	8.00	1.65	2.00
Georgia Special Tobacco .....	8.00	1.65	2.00
Georgia Special Wheat and Corn Grower....	8.00	.82	4.00
Acid Phosphate with 4 Per Cent Potash.....	8.00	....	4.00
Nitrate of Soda .....	....	14.82	....
Cotton-seed Meal .....	....	6.18	....
Muriate of Potash .....	....	....	48.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00

*Griffith & Boyd Co., Baltimore, Md.—*

High Grade 16 Per Cent Acid Phosphate.....	16.00	....	....
Grower's Favorite .....	8.00	3.30	4.00
Farmers' Potato Manure .....	8.00	.82	9.00
Fish, Bone, and Potash.....	7.25	1.50	3.00
7 Per Cent Guano .....	5.00	5.75	5.00

*Hadley, Harris & Co., Inc., Wilson, N. C.—*

Golden Weed Tobacco Grower.....	8.00	2.47	3.00
Hadley Boss Guano .....	8.00	2.26	2.50
Daisy Fish Mixture .....	8.00	1.65	2.00
Harris' Java Tobacco Guano.....	7.00	3.30	7.00
Harris' Electric Top Dresser.....	2.00	8.22	3.00

*Hampton Guano Co., Norfolk, Va.—*

Pure Ground Bone .....	Total	20.00	3.70	....
Supreme Acid Phosphate .....		16.00	....	....
Hampton Acid Phosphate .....		14.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Hampton 12-5 Bone and Potash.....	12.00	....	5.00
Hampton Bone and Potash Mixture .....	11.00	....	2.00
Hampton Crop Grower .....	10.00	....	4.00
Dauntless Potash Mixture .....	10.00	....	2.00
Arlington Animal Bone Fertilizer .....	9.00	1.85	4.00
Alpha Crop Grower .....	8.50	2.06	2.50
Hampton H. G. Tobacco Grower.....	8.00	3.29	4.00
Little's Favorite Crop Grower.....	8.00	3.29	4.00
Hampton Tobacco Guano .....	8.00	2.47	3.00
P. P. P. Princess Prolific Producer.....	8.00	2.47	3.00
Extra Tobacco Guano .....	8.00	1.65	2.00
Shirley Superphosphate .....	8.00	1.65	2.00
Hampton Special Grain and Peanut Fertilizer	8.00	1.00	4.00
Excelsior Bone and Potash .....	8.00	....	4.00
Reliance Truck Guano .....	7.00	4.11	5.00
Virginia Truck Grower .....	6.00	5.76	5.00
Hampton 10 Per Cent Truck Grower.....	5.00	8.23	3.00
Hampton Top Dresser .....	4.00	8.23	2.00
Nitrate of Soda .....	....	15.00	....
Dry Ground Fish .....	....	8.23	....
Special Top Dresser .....	....	7.41	3.00
Muriate of Potash .....	....	....	49.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00

*S. B. Harrell & Co., Inc., Norfolk, Va.—*

Harrell's Acid Phosphate .....	14.00	....	....
Harrell's Eclipse .....	9.00	2.26	2.00
Harrell's Champion Cotton and Peanut Grower .....	8.00	1.65	2.00
Harrell's Truck Guano .....	6.00	5.76	5.00

*Home Fertilizer and Chemical Co., Baltimore, Md.—*

Eclipse Dissolved Phosphate .....	16.00	....	....
Home High Grade Acid Phosphate.....	14.00	....	....
Home Dissolved Animal Bone.....	12.00	1.65	....
Gilt Edge Crop Grower.....	10.00	1.65	4.00
Eclipse Blood, Beef and Bone.....	10.00	1.23	3.00
Home Bone and Potash.....	10.00	....	5.00
Home Alkaline Bone .....	10.00	....	2.00
Home Ammoniated Bone .....	9.00	1.65	3.00
Home B. G. Ammoniated Compound.....	9.00	.82	5.00
Everybody's Fertilizer .....	9.00	.82	2.00
Home Standard Guano .....	8.00	3.30	4.00
Eclipse Dissolved Bone and Potash.....	8.00	2.48	4.00
Riosa Tobacco Compound .....	8.00	2.48	3.00
Special C. & C. Compound.....	8.00	2.48	3.00
Yancey's Formula for Yellow Leaf Tobacco..	8.00	2.48	2.00
Phoenix Crop Grower .....	8.00	2.48	2.00
Home Potato Special .....	8.00	1.65	10.00
Matchless Guano .....	8.00	1.65	4.00
Home Cereal Fertilizer .....	8.00	1.65	2.00
Ammoniated Bone Manure .....	7.00	1.65	5.00
Farmer's Choice .....	7.00	.82	4.00
Trucker's Special Compound .....	6.00	5.77	5.00
Home Vegetable Fertilizer .....	6.00	4.12	6.00
Eclipse Ammoniated Compound .....	6.00	3.30	10.00
Home Potato Grower .....	6.00	3.30	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Sulphate of Ammonia .....	....	20.62	....
Nitrate of Soda .....	....	14.85	....
Cerealite Top Dressing .....	....	7.43	3.00
Home Fertilizer .....	....	5.77	7.00
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
German Kainit .....	....	....	12.00

*The Hubbard Fertilizer Co., Baltimore, Md.—*

Hubbard's 16 Per Cent Phosphate .....	16.00	....	....
Hubbard's 14 Per Cent Phosphate .....	14.00	....	....
Hubbard's Special Mixture 10 and 4.....	10.00	....	4.00
Hubbard's B. and P. 10 and 2.....	10.00	....	2.00
Hubbard's Noxall .....	8.00	3.28	4.00
Hubbard's Royal Ensign .....	8.00	2.46	4.00
Hubbard's Yellow Wrapper .....	8.00	2.46	3.00
Hubbard's Fish Compound .....	8.00	1.64	3.00
Hubbard's Exchange Guano .....	8.00	1.64	2.00
Hubbard's Southern Leader .....	7.00	3.28	5.00
Hubbard's 5 Per Cent Royal Seal.....	6.00	4.10	5.00
Hubbard's New Process Top Dresser.....	....	7.51	3.50
Pure German Kainit .....	....	....	12.40

*The Imperial Co., Norfolk, Va.—*

Imperial Pure Ground Bone .....Total	20.00	3.70	....
Imperial High Grade Tennessee Acid Phos- phate .....	16.00	....	....
Imperial High Grade Acid Phosphate.....	14.00	....	....
Imperial Special Potash Mixture .....	12.00	....	5.00
Imperial Catawba Wheat Grower .....	10.00	....	4.00
Imperial Carolina Wheat Mixture .....	10.00	....	3.00
Imperial Virginia Grain Mixture .....	10.00	....	2.00
Imperial Bone and Potash .....	10.00	....	2.00
Imperial Martin County Special Crop Grower	9.00	2.26	2.00
Imperial Crop Grower .....	9.00	1.65	4.00
Imperial Snowflake Cotton Grower .....	8.00	3.29	4.00
Imperial Tobacco Grower .....	8.00	3.29	4.00
Imperial Robeson County Special .....	8.00	2.47	4.00
Imperial X. L. O. Cotton Guano.....	8.00	2.47	3.00
Imperial Tobacco Guano .....	8.00	2.47	3.00
Imperial Yellow Bark Sweet Potato Guano..	8.00	2.47	3.00
Imperial Pee Dee Cotton Grower.....	8.00	2.47	3.00
Imperial F. and B. Cotton Guano.....	8.00	2.06	3.00
Imperial Bright Tobacco Guano .....	8.00	2.06	3.00
Imperial Tennessee Tobacco Guano .....	8.00	1.65	8.00
Imperial Peanut Guano .....	8.00	1.65	4.00
Imperial Cotton Grower .....	8.00	1.65	2.00
Imperial Champion Guano .....	8.00	1.65	2.00
Imperial Peanut and Corn Guano.....	8.00	1.65	2.00
Imperial Cisco Soluble Guano .....	8.00	1.65	2.00
Imperial Standard Premium Guano .....	8.00	1.65	2.00
Imperial Ammoniated Guano .....	8.00	1.00	4.00
Imperial Fish and Bone Grain Grower.....	8.00	.82	4.00
Imperial Yadkin Wheat Grower .....	8.00	....	4.00
Imperial 7-7-7 Potato Guano .....	7.00	5.76	7.00
Imperial High Grade Irish Potato Guano....	7.00	4.11	8.00
Imperial Dawson's Cotton Grower .....	7.00	2.67	2.75
Imperial Roanoke Crop Grower .....	7.00	2.47	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Imperial Asparagus Mixture .....	6.00	4.94	7.00
Imperial 5-6-7 Potato Guano .....	6.00	4.11	7.00
Imperial Williams' Special Potato Guano....	6.00	4.11	5.00
Imperial Fish and Bone .....	6.00	3.29	4.00
Imperial Sweet Potato Guano .....	6.00	1.65	6.00
Imperial 10 Per Cent Guano.....	5.00	8.23	2.50
Imperial Ammonia Top Dresser for Spinach.	5.00	8.23	....
Imperial Special 7 Per Cent for Potatoes....	5.00	5.76	5.00
Imperial Eastern Shore Sweet Potato Special	5.00	3.29	9.00
Imperial Special Tobacco Guano .....	5.00	3.29	9.00
Imperial Top Dresser for Cotton.....	4.00	8.23	2.00
Imperial Laughinghouse Special Tobacco Guano .....	4.00	3.29	6.00
Imperial Conetoe Cotton Grower .....	4.00	3.29	4.00
Imperial Cubanola Tobacco Guano .....	4.00	2.47	5.00
Imperial Nitrate of Soda .....	....	15.00	....
Imperial Top Dresser .....	....	7.40	3.00
Imperial Dry Ground Fish .....	....	8.23	....
Imperial Muriate of Potash .....	....	....	49.00
Imperial Sulphate of Potash .....	....	....	48.00
Imperial Genuine German Kainit .....	....	....	12.00

*N. B. Josey Guano Co., Tarboro, N. C.—*

Josey's 16 Per Cent Acid Phosphate.....	16.00	....	....
Josey's Bone and Potash .....	10.00	....	4.00
Josey's Truck Guano .....	8.00	4.10	5.00
Josey's Big Yield Guano.....	8.00	3.30	4.00
Josey's S-4-4 C. S. Meal and Fish Scrap Guano	8.00	3.30	4.00
Josey's Special Tobacco Guano.....	8.00	2.47	5.00
Josey's Tip Top C. S. Meal and Fish Scrap Guano .....	8.00	2.47	3.00
Josey's Bright Leaf Tobacco Guano.....	8.00	2.47	3.00
Josey's "U No" Guano.....	8.00	2.47	3.00
Josey's Quick Step Tobacco Guano.....	8.00	2.06	3.00
Josey's Favorite C. S. Meal and Fish Scrap Guano .....	8.00	2.05	2.50
Josey's C. S. Meal Guano.....	8.00	1.65	2.00
Josey's Potato Guano .....	7.00	5.77	7.00
Josey's ("Big Four") C. S. M. and F. S. Guano	6.00	3.30	4.00
Josey's Peanut Guano .....	5.50	1.23	5.50
Josey's Elite Top Dresser .....	3.00	7.42	4.00
Nitrate of Soda .....	....	15.50	....
Josey's Top Dresser .....	....	7.42	4.00
Cotton-seed Meal .....	....	6.19	....
Muriate of Potash .....	....	....	48.00
Manure Salts .....	....	....	20.00
Genuine German Kainit .....	....	....	12.00

*Lister's Agricultural Chemical Works, Newark, N. J.—*

Lister's H. G. Phosphoric Acid Phosphate....	16.00	....	....
Lister's Buyers' Choice Acid Phosphate.....	14.00	....	....
Lister's Phosphoric Acid and Phosphate .....	10.00	....	4.00
Lister's Dissolved Phosphate and Potash....	10.00	....	2.00
Lister's Carolina Bright for Tobacco.....	9.00	2.47	3.00
Lister's Standard Pure Bone Superphosphate of Lime .....	9.00	1.65	2.00
Lister's Complete Manure .....	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Lister's Special Tobacco Fertilizer .....	8.00	2.06	3.00
Lister's Ammoniated Dissolved Bone Phosphate .....	8.00	2.06	2.00
Lister's Success Fertilizer .....	8.00	1.65	2.00

*John F. McNair, Laurinburg, N. C.—*

Nitrate of Soda .....	....	15.20	....
Muriate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00

*McNair Phosphate Co., Laurinburg, N. C.—*

Rob Roy .....	8.00	5.76	5.00
Sodash .....	2.00	7.29	5.00

*The MacMurphy Co., Charleston, S. C.—*

High Grade Acid Phosphate, 14 Per Cent....	14.00	....	....
Acid Phosphate .....	13.00	....	....
Acid Phosphate and Potash.....	12.00	....	1.00
Acid Phosphate and Potash.....	11.00	....	1.00
Acid Phosphate and Potash.....	10.00	....	5.00
Acid Phosphate and Potash.....	10.00	....	4.00
Acid Phosphate and Potash.....	10.00	....	2.00
Wilcox & Gibbs Co.'s Manipulated Guano....	9.25	2.26	2.00
Special 8-4-6 Guano .....	8.00	3.29	6.00
Special 8-4-4 Cotton Guano.....	8.00	3.29	4.00
Special 8-4-4 Tobacco Guano.....	8.00	3.29	4.00
Special 8-3-4 Tobacco Guano.....	8.00	2.47	4.00
Special 8-3-3 Cotton and Corn.....	8.00	2.47	3.00
Special 8-3-3 Tobacco Guano.....	8.00	2.47	3.00
Standard 8-2½-1 Cotton Guano.....	8.00	2.06	1.00
Special 8-2-2 Cotton Guano.....	8.00	1.65	2.00
Special 9.25-2-2 Cotton and Corn Guano.....	2.25	1.65	2.00
Nitrate of Soda .....	....	14.81	....
Muriate of Potash .....	....	....	48.00
Sulphate of Potash .....	....	....	48.00

*The Mapes Formula and Peruvian Guano Co.,  
Newark, N. J.—*

Mapes' Complete Manure, "A" Brand.....	10.00	2.47	2.50
Mapes' Corn Manure .....	8.00	2.47	6.00
Mapes' Vegetable or Complete Manure for Light Soils .....	6.00	4.94	6.00
Mapes' Economical Potato Manure.....	4.00	3.29	8.00

*Marietta Fertilizer Co., Atlanta, Ga.—*

Marietta Blood and Bone Special.....	9.00	.82	3.00
Marietta Beef Blood and Bone.....	9.00	.82	2.00
Fertilizer, No. 835 .....	8.00	2.47	5.00
5 Per Cent Trucker .....	6.00	4.11	7.00

*Martin Fertilizer Co., Norfolk, Va., and New Bern,  
N. C.—*

Martin's Pure Ground Bone.....	22.00	2.46	....
Martin's Raw Bone Meal .....	21.00	3.70	....
Martin's Acid Phosphate .....	16.00	....	....
Martin's Acid Phosphate .....	14.00	....	....
Martin's Pure Dissolved Animal Bone.....	12.00	1.65	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Martin's Potash and Soluble Bone.....	12.00	....	5.00
Martin's Potash and Soluble Bone.....	12.00	....	3.00
Martin's Potash and Soluble Bone.....	10.00	....	6.00
Martin's Potash and Soluble Bone.....	10.00	....	5.00
Martin's Potash and Soluble Bone.....	10.00	....	4.00
Jennett's Potash and Soluble Bone.....	10.00	....	4.00
Martin's Potash and Soluble Bone.....	10.00	....	3.00
Martin's Potash and Soluble Bone.....	10.00	....	2.00
Jennett's Potash and Soluble Bone.....	10.00	....	2.00
Martin's Tobacco Special .....	9.00	2.46	3.00
Martin's Cotton Special .....	9.00	2.46	3.00
Martin's Tobacco Compound .....	9.00	2.26	2.00
Johnson's High Grade .....	9.00	2.05	5.00
Martin's Dissolved Organic Compound.....	9.00	1.00	3.00
Martin's Corn and Cereal Special.....	9.00	1.00	2.00
Martin's High Grade Guano.....	8.75	1.65	2.00
Martin's Blood, Bone and Potash.....	8.00	4.10	7.00
Martin's Red Star Brand Fertilizer.....	8.00	4.10	5.00
Special Fertilizer .....	8.00	3.28	6.00
Martin's Cotton and Tobacco Guano.....	8.00	3.28	6.00
Martin's Cotton Guano .....	8.00	3.28	4.00
Martin's Red Star Brand .....	8.00	3.28	4.00
Martin's Tobacco Special .....	8.00	3.28	4.00
Jennett's Cotton Guano .....	8.00	3.28	4.00
Martin's Blue Ribbon Brand Fertilizer.....	8.00	3.28	2.00
Martin's Bull Head Fertilizer.....	8.00	2.46	8.00
Martin's Cotton and Tobacco Guano .....	8.00	2.46	5.00
Privott's Favorite .....	8.00	2.46	4.00
Martin's Bull Head .....	8.00	2.46	3.00
Martin's Tobacco Special .....	8.00	2.46	3.00
Jennett's Slaughter House Mixture .....	8.00	2.46	3.00
Martin's Meal Mixture .....	8.00	2.46	3.00
Martin's Tobacco Special .....	8.00	2.06	5.00
Martin's Meal Mixture .....	8.00	2.06	4.00
Martin's Meal Mixture .....	8.00	2.05	4.00
Martin's Special Fertilizer .....	8.00	2.05	3.00
Martin's Cotton Guano .....	8.00	2.05	1.00
Privott's Special for Potatoes and Peanuts...	8.00	1.65	6.00
Martin's Cotton and Tobacco Guano.....	8.00	1.65	5.00
Martin's Cotton and Tobacco Guano .....	8.00	1.65	3.00
Martin's Animal Organic Compound .....	8.00	1.65	3.00
Martin's Slaughter House Special .....	8.00	1.65	2.00
Martin's Wheat Special .....	8.00	1.65	2.00
Martin's Carolina Special for Tobacco.....	8.00	1.65	2.00
Martin's Carolina Cotton .....	8.00	1.65	2.00
Martin's Corn and Cereal Special.....	8.00	1.65	2.00
Martin's Old Virginia Favorite.....	8.00	1.65	2.00
Jennett's Beef Blood and Bone.....	8.00	1.65	2.00
Martin's One Eight Four.....	8.00	1.03	4.00
Martin's Peanut Grower .....	8.00	1.03	4.00
Martin's Potash and Soluble Bone.....	8.00	....	4.00
Martin's Top Dresser .....	7.00	8.22	2.50
Martin's Red Star Brand Fertilizer.....	7.00	4.10	5.00
Abbott's Special .....	7.00	3.28	8.00
Martin's Gilt Edge Potato Manure.....	7.00	2.46	10.00
Martin's 7 Per Cent Guano.....	6.00	5.74	5.00
Martin's Animal Bone Potato Fertilizer.....	6.00	4.10	7.00
Martin's Early Truck and Vegetable Grower.	6.00	3.28	8.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Knowles' Special .....	6.00	3.28	6.00
Martin's Top Dresser .....	5.00	8.23	2.50
Martin's Nitrate Soda .....	....	15.23	....
Martin's Muriate of Potash.....	....	....	50.00
Martin's Sulphate of Potash.....	....	....	48.00
Martin's Kainit .....	....	....	48.00

*E. H. & J. A. Meadows Co., New Bern, N. C.—*

Diamond Acid Phosphate .....	16.00	....	....
Diamond Acid Phosphate .....	14.00	....	....
Meadows' Dissolved Bone and Potash Com- pound .....	10.00	....	5.00
Meadows' Dissolved Bone and Potash Com- pound .....	10.00	....	4.00
Meadows' Lobos Guano .....	8.00	4.11	5.00
Meadows' Ideal Tobacco Guano.....	8.00	3.29	4.00
Brooks' Special Tobacco Grower.....	8.00	2.47	5.00
Parker's Special Tobacco Guano.....	8.00	2.47	4.00
Meadows' Gold Leaf Tobacco Guano.....	8.00	2.47	3.00
Meadows' Roanoke Guano .....	8.00	2.05	3.00
Meadows' All Crop Guano.....	8.00	2.05	2.50
Meadows' Cotton Guano .....	8.00	1.65	2.00
Meadows' Great Cabbage Guano.....	7.00	5.76	7.00
Meadows' Great Potato Guano.....	7.00	4.11	8.00
Nitrate of Soda .....	....	15.50	....
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	50.00
Meadows' German Kainit .....	....	....	12.40

*The Miller Fertilizer Co., Baltimore, Md.—*

Miller's 16 Per Cent Acid Phosphate.....	16.00	....	....
Miller's 14 Per Cent Acid Phosphate.....	14.00	....	....
Corn and Peanut Grower .....	10.50	....	2.25
Corn and Wheat Grower .....	10.50	....	2.25
The Miller Fertilizer Co.'s 10 and 4 Per Cent. Clinch .....	10.00	....	4.00
Trucker .....	10.00	....	2.00
No. 1 Potato and Vegetable Grower.....	8.00	4.12	5.00
Miller's Irish Potato .....	8.00	3.71	7.00
4 Per Cent Tobacco .....	8.00	3.29	4.00
Standard Phosphate .....	8.00	3.29	4.00
Tobacco King .....	8.00	2.47	3.00
Miller's High Grade .....	8.00	2.47	3.00
Special Tobacco Grower .....	8.00	2.06	3.00
Potato and Vegetable Guano.....	8.00	1.65	4.00
Ammoniated Dissolved Bone .....	8.00	1.65	4.00
Farmer's Profit .....	8.00	1.65	2.00
Miller's 8 and 4 .....	8.00	1.65	2.00
High Grade Potato .....	8.00	....	4.00
Special .....	6.00	4.12	7.00
Nitrate of Soda .....	4.00	6.58	3.00
Muriate of Potash .....	....	15.05	....
Sulphate of Ammonia .....	....	....	50.00
	....	....	48.00

*Navassa Guano Co., Wilmington, N. C.—*

Navassa Piedmont Wheat Grower.....	10.00	....	2.00
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Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
<i>New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.—</i>			
Thomas Phosphate .....	Total 18.00	....	....
Bone Meal .....	Total 16.00	2.47	....
16 Per Cent Acid Phosphate.....	16.00	....	....
14 Per Cent Acid Phosphate.....	14.00	....	....
Special Corn and Peanut Grower.....	11.00	....	2.00
High Grade Bone and Potash.....	10.00	....	4.00
Carteret Bone and Potash.....	10.00	....	2.00
Greene County Tobacco Fertilizer .....	9.00	2.47	5.00
Sparrow's Special Tobacco Grower .....	9.00	2.47	3.00
Oriole Tobacco Grower .....	8.00	3.30	4.00
Harvey's Special Meal and Fish Guano.....	8.00	2.47	3.00
Special C. S. M. Mixture.....	8.00	2.47	3.00
Foy's High Grade Fertilizer.....	8.00	2.47	3.00
Lenoir Bright Leaf Tobacco Grower .....	8.00	2.47	3.00
Pitt's Prolific Golden Tobacco Guano .....	8.00	2.47	3.00
Favorite Cotton Grower .....	8.00	2.27	2.00
Onslow's Farmers' Reliance Guano.....	8.00	2.06	3.00
Jones County Premium Crop Grower .....	8.00	2.06	3.00
Craven Cotton Guano .....	8.00	1.65	2.00
Greene County Standard Fertilizer.....	8.00	1.65	2.00
Dunn's Standard Truck Grower.....	7.00	5.77	7.00
Ives' Irish Potato Guano.....	7.00	4.12	7.00
Eureka Tobacco Fertilizer .....	6.00	3.30	7.00
Hart's Special Tobacco Grower.....	6.00	2.47	6.00
Pamlico Electric Top Dresser.....	5.00	8.25	2.50
Wooten's Special Tobacco Guano .....	4.00	3.30	6.00
Sulphate of Ammonia .....	....	20.62	....
Nitrate of Soda .....	....	15.67	....
Ground Blood .....	....	13.20	....
Ground Tankage .....	....	9.00	....
Eureka Top Dresser .....	....	8.25	3.00
High Grade Fish Scrap.....	....	8.25	....
Cotton-seed Meal .....	....	6.18	....
Sulphate of Potash .....	....	....	50.00
Muriate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00
<i>Nitrate Agencies Co., New York, Baltimore, Savannah, Charleston, and Norfolk—</i>			
Acid Phosphate .....	16.00	....	....
Basic Slag .....	Total 14.00	....	....
Ground Fish .....	7.00	9.35	....
Nitrate of Soda .....	....	15.00	....
Ground Dried Blood .....	....	13.16	....
Ground Tankage .....	....	9.04	....
Muriate of Potash .....	....	....	48.00
Sulphate of Potash .....	....	....	47.00
Kainit .....	....	....	12.00
<i>Norfolk Fertilizer Co., Norfolk, Va.—</i>			
Pure Ground Bone .....	Total 20.00	3.70	....
Oriana 16 Per Cent Acid Phosphate.....	16.00	....	....
Whitney H. G. Acid Phosphate.....	16.00	....	....
Oriana 14 Per Cent Acid Phosphate.....	14.00	....	....
Oriana Wheat Grower .....	10.00	....	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Shenandoah Wheat Mixture .....	10.00	....	3.00
Young's Grain Grower .....	10.00	....	2.00
Oriana Bone and Potash .....	10.00	....	2.00
Oriana C. S. M. Special .....	9.00	2.26	2.00
Oriana Complete Fertilizer .....	8.00	3.29	4.00
Oriana First Step Tobacco Guano .....	8.00	3.29	4.00
Oriana Tobacco Guano .....	8.00	2.47	3.00
Oriana for Cotton .....	8.00	2.47	3.00
Oriana Bright Leaf Guano .....	8.00	2.06	3.00
Oriana Cotton Guano .....	8.00	1.65	2.00
Oriana Crop Grower .....	8.00	1.65	2.00
Mayodan Valley Wheat Grower .....	8.00	....	4.00
Oriana Special Mixture .....	6.00	4.11	5.00
Oriana Truck Guano .....	5.00	5.76	5.00
Pine Top Special Crop Grower .....	5.00	1.65	6.00
Nitrate of Soda Mixture for Top Dressing Cotton .....	4.00	8.23	2.00
Oriana High Grade Tobacco Guano .....	4.00	3.29	6.00
Nitrate of Soda .....	....	15.00	....
Dry Ground Fish .....	....	8.23	....
Norfolk Top Dresser .....	....	7.40	3.00
Muriate of Potash .....	....	....	49.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00
<i>Norfolk Tallow Co., Norfolk, Va.—</i>			
Nataleo Ground Bone .....	8.00	2.45	....
<i>North Carolina Cotton Oil Co., Charlotte, N. C.—</i>			
Dixie Standard .....	8.00	2.48	3.00
Majestic .....	8.00	1.65	2.00
<i>North Carolina Cotton Oil Co., Henderson, N. C.</i>			
Special Mixture W. F. Marsh, Jr. ....	10.00	2.47	3.00
Pride of Vance Tobacco Fertilizer .....	9.00	2.47	3.00
Unecedit Tobacco Fertilizer .....	9.00	2.47	3.00
Henderson Tobacco Fertilizer .....	9.00	2.47	3.00
Franklin Tobacco Fertilizer .....	9.00	2.47	3.00
Currin's Special for Tobacco .....	8.00	3.29	4.00
Two in One .....	8.00	3.28	4.00
Sulphate of Potash Brand Tobacco Guano...	8.00	2.47	3.00
Henderson High Grade .....	8.00	2.47	3.00
McKinne Mixture .....	8.00	2.26	3.25
Henderson Standard Guano .....	8.00	2.26	2.00
Brewer's Special .....	8.00	2.26	2.00
American Pet .....	8.00	2.26	2.00
Henderson Cotton Grower .....	8.00	1.65	2.00
Franklin Cotton Grower .....	8.00	1.65	2.00
Unecedit Cotton Grower .....	8.00	1.65	2.00
Vance Cotton Grower .....	8.00	1.65	2.00
Nitrate of Soda .....	....	14.80	....
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
<i>North Carolina Cotton Oil Co., Raleigh, N. C.—</i>			
Raleigh Special Guano .....	8.00	2.47	3.00
Raleigh Standard Guano .....	8.00	2.26	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
<i>North Carolina Cotton Oil Co., Wilmington, N. C.—</i>			
High Grade Acid Phosphate.....	16.00	....	....
Wilmington Bone and Potash .....	10.00	....	4.00
Pate's High Grade .....	9.00	2.47	3.00
Cockrell & Williams' Cotton Grower.....	9.00	2.27	2.00
Wilmington Mortgage Lifter .....	9.00	2.27	7.00
Wilmington's Pride .....	8.00	4.12	7.00
Wilmington's Truck Grower .....	8.00	3.30	4.00
Bullock's High Grade .....	8.00	3.30	4.00
Wilmington's Full Value .....	8.00	3.30	4.00
Wilmington Tobacco Grower .....	8.00	3.30	4.00
Wilmington Fruit Grower .....	8.00	2.47	10.00
Best Tobacco Grower .....	8.00	2.47	7.50
John's Special .....	8.00	2.47	4.00
Bullock's Cotton Grower .....	8.00	2.47	4.00
Wilmington Farmer Boy .....	8.00	2.47	4.00
Wilmington High Grade .....	8.00	2.47	3.00
Wilmington Leader .....	8.00	2.47	3.00
Clute's Cotton Grower .....	8.00	2.47	3.00
L. P. B. Special.....	8.00	2.47	3.00
Carter's Lifter .....	8.00	2.47	3.00
Lewis's Special .....	8.00	2.47	3.00
Cooper's Special .....	8.00	2.47	3.00
The Stone Company Special.....	8.00	2.47	3.00
Wilmington Standard .....	8.00	2.47	2.50
Pate's Special .....	8.00	2.47	2.00
Currie's Crop Grower .....	8.00	2.06	4.00
Wilmington Banner .....	8.00	1.65	3.00
Clark's Special .....	8.00	1.65	3.00
Maultsby's Cotton Grower .....	8.00	1.65	3.00
Wilmington Cotton Grower .....	8.00	1.65	2.00
Wilmington Special .....	8.00	1.65	2.00
Wilmington Cotton Mixture .....	7.00	2.47	5.00
High Grade Tobacco .....	6.00	3.30	10.00
Wilmington Headlight .....	6.00	3.30	8.00
Wilmington High Grade Top Dresser.....	4.50	7.40	3.00
Sulphate of Ammonia .....	....	19.68	....
Nitrate of Soda .....	....	14.80	....
Dried Blood .....	....	13.12	....
H. G. Ground Tankage.....	....	8.20	....
Wilmington Special Top Dresser.....	....	7.40	3.00
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
Kainit .....	....	....	12.00

*G. Ober & Sons Co., Baltimore, Md.—*

Pure Raw Bone Meal.....Total	21.00	3.71	....
Ober's High Grade Acid Phosphate.....	16.00	....	....
Ober's Dissolved Bone Phosphate.....	14.00	....	....
Ober's Standard Potash Compound.....	12.00	....	5.00
Ober's Dissolved Animal Bone .....	10.00	2.47	....
Ober's Acid Phosphate with Potash.....	10.00	....	4.00
Ober's Dissolved Bone, Phosphate and Potash	10.00	....	2.00
Ober's Special High Grade Fertilizer.....	9.00	2.47	3.00
Ober's Special Ammoniated Dissolved Bone..	9.00	1.65	2.00
Ober's Farmers' Mixture .....	9.00	.82	2.00
Ober's H. G. Fertilizer.....	8.00	3.30	4.00
Ober's Complete Guano for All Crops.....	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Ober's Special Compound for Tobacco.....	8.00	2.47	3.00
Cooper's Pungo .....	8.00	2.06	2.00
Ober's Standard Tobacco Fertilizer.....	8.00	1.65	2.00
Ober's Special Cotton Compound.....	8.00	1.65	2.00
Ober's Soluble Ammoniated Superphosphate of Lime .....	8.00	1.65	2.00
Ober's Stag Guano .....	8.00	.82	4.00
Ober's Acid Phosphate with Potash.....	8.00	....	4.00
Ground Fish .....	7.30	9.00	....
Ober's Complete Vegetable Fertilizer.....	7.00	4.12	5.00
Red Seal Special Tobacco Guano.....	6.00	2.47	7.00
Ober's Special Tobacco Bed Fertilizer, 10 Per Cent .....	4.00	8.25	3.00
Nitrate of Soda .....	....	15.50	....
Ground Blood .....	....	13.00	....
Sulphate of Potash .....	....	....	48.00
Muriate of Potash .....	....	....	48.00
Kainit .....	....	....	12.00

*Pan-American Fertilizer Co., Norfolk, Va.—*

Pan-American 16 Per Cent Acid Phosphate...	16.00	....	....
Pan-American 10 and 2 .....	10.00	....	2.00
Pan-American Favorite Compound .....	8.00	3.29	4.00
Pan-American Special Cotton Grower.....	8.00	2.47	3.00
Pan-American Universal Phosphate .....	8.00	1.65	2.00
Pan-American Special .....	7.00	5.76	5.00
Pan-American 6 Per Cent Trucker.....	7.00	4.94	5.00
Pan-American P. Trucker .....	6.00	5.76	6.00
Pan-American Universal Trucker .....	6.00	5.76	5.00
Pan-American Carolina Trucker .....	6.00	4.11	7.00
Pan-American Dixie Standard .....	6.00	4.11	5.00
Pan-American Tip Top Dresser.....	5.00	8.23	2.00
Pan-American Potato and Truck Special .....	5.00	5.76	5.00
Pan-American Universal Top Dresser .....	3.00	8.23	4.00

*Patapsco Guano Co., Baltimore, Md.—*

Patapsco Pure Raw Bone.....Total	21.51	3.70	....
Florida Soluble Phosphate .....	16.00	....	....
Patapsco Pure Dissolved S. C. Phosphate.....	14.00	....	....
Patapsco High Grade Phosphate and Potash..	11.00	....	5.00
Baltimore Soluble Phosphate .....	11.00	....	2.00
Patapsco 10 and 4 Potash Mixture.....	10.00	....	4.00
Patapsco Soluble Phosphate and Potash.....	10.00	....	2.00
Patapsco Guano for Tobacco .....	9.25	2.06	2.00
Patapsco Guano .....	9.25	2.06	2.00
Patapsco Tobacco Fertilizer .....	9.00	2.47	3.00
Patapsco Bright Tobacco Grower.....	9.00	2.26	2.00
Patapsco Cotton and Corn Special.....	9.00	2.06	5.00
Patapsco Cotton Growers' Special .....	9.00	1.65	3.00
Coon Brand Guano .....	9.00	.82	3.00
Patapsco Cotton and Tobacco Special.....	8.00	3.29	4.00
Patapsco Plant Food for Tobacco, Potatoes and Truck .....	8.00	2.47	5.00
Patapsco Gold Leaf C. S. M. Mixture.....	8.00	2.47	3.00
Choctaw Guano .....	8.00	2.47	3.00
Patapsco H. G. Tobacco Special.....	8.00	2.47	3.00
Patapsco Special Tobacco Mixture.....	8.00	2.06	3.00
Unicorn Guano .....	8.00	2.06	3.00
Planters Favorite .....	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Grange Mixture, C. S. M. Base.....	8.00	1.65	2.00
Sea Gull Ammoniated Guano.....	8.00	1.65	2.00
Patapsco 7-7-7 Truck Guano.....	7.00	5.76	7.00
Patapsco Trucker for Early Vegetables.....	7.00	4.11	5.00
Money Maker Guano.....	7.00	3.70	6.00
Dry Ground Fish.....Total	6.00	8.23	....
Patapsco Potato Guano.....	6.00	4.11	7.00
Patapsco Crop Dresser.....	4.00	3.29	4.00
Nitrate of Soda.....	....	15.00	....
Patapsco Top Dresser.....	....	7.41	3.00
Muriate of Potash.....	....	....	49.00
Genuine German Kamit.....	....	....	12.00

*Peruvian Guano Corporation, Charleston, S. C.—*

Peruvian Sulphate Tobacco Formula.....	10.00	1.65	8.00
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*The Phosphate Mining Co., Goronah, Ga.—*

"Supreme" Acid Phosphate.....	18.00	....	....
Acid Phosphate.....	17.00	....	....
"Superfine" Acid Phosphate.....	16.00	....	....
Acid Phosphate.....	15.00	....	....
"Superior" Acid Phosphate.....	14.00	....	....
Acid Phosphate.....	13.00	....	....
Acid Phosphate.....	12.00	....	....

*Piedmont-Mount Airy Guano Co., Baltimore, Md.—*

Piedmont Bone Meal.....Total	21.00	3.29	....
Piedmont 16 Per Cent Acid Phosphate.....	16.00	....	....
Piedmont 14 Per Cent Acid Phosphate.....	14.00	....	....
Piedmont Special Potash Mixture.....	10.00	....	5.00
Levering's Potashed Bone.....	10.00	....	4.00
Piedmont Farmers' Potash Mixture.....	10.00	....	2.00
Piedmont Farmers' Standard.....	9.00	1.65	2.00
Piedmont Essential Tobacco Compound.....	9.00	1.65	2.00
Levering's Ammoniated Bone.....	9.00	.82	3.00
Piedmont Unexcelled Guano.....	8.00	3.29	4.00
Piedmont Special Tobacco Guano.....	8.00	2.47	4.00
Piedmont High Grade Ammoniated Bone and Potash.....	8.00	2.47	3.00
Levering's Reliable Tobacco Guano.....	8.00	2.47	3.00
Piedmont Guano for Tobacco.....	8.00	2.06	3.00
Piedmont Guano for All Crops.....	8.00	2.06	3.00
Levering's Standard.....	8.00	1.65	3.00
Piedmont Bone and Peruvian Mixture.....	8.00	1.65	2.00
Piedmont Cultivator Brand.....	8.00	1.65	2.00
Piedmont Red Leaf Tobacco Guano.....	8.00	1.65	2.00
Piedmont Farmers' Favorite.....	8.00	.82	4.00
Piedmont Star Bone and Potash.....	8.00	....	5.00
Piedmont 7-7-7 Truck Guano.....	7.00	5.76	7.00
Piedmont Special Truck Fertilizer.....	6.00	5.76	5.00
Piedmont Special Potato Guano.....	6.00	4.94	7.00
Piedmont Early Vegetable Manure.....	6.00	4.12	7.00
Piedmont Early Trucker.....	6.00	4.12	5.00
Piedmont Vegetable Compound.....	6.00	3.29	8.00
Piedmont 7 Per Cent Truck Guano.....	5.00	5.76	5.00
Piedmont Potato Producer.....	5.00	2.47	6.00
Nitrate of Soda.....	....	15.23	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Boykin's Top Dresser .....	.....	7.41	3.00
Muriate of Potash .....	.....	.....	50.00
Sulphate of Potash .....	.....	.....	48.00
German Kainit .....	.....	.....	12.00

*Planters Cotton Oil and Fertilizer Co., Rocky  
Mount, N. C.—*

Acid Phosphate .....	16.00	.....	.....
Royal Cotton Grower .....	9.00	2.26	2.00
J. P. D. Special.....	8.00	3.29	5.00
Gorham H. G. ....	8.00	3.29	4.00
Robertson's Tobacco Compound .....	8.00	2.47	5.00
Tar River Special .....	8.00	2.47	3.00
Planters' C. S. Oil Co.'s Tobacco Guano.....	8.00	2.47	3.00
Break's Corn Special .....	8.00	1.65	7.00
Planters' Pride for Cotton .....	8.00	1.65	2.00
Planters' C. S. Oil Co.'s Cotton Guano.....	8.00	1.65	2.00
Planters' Peanut Mixture .....	8.00	1.21	5.00
Planters' Special Potato Guano.....	7.00	4.12	5.00
Braswell's Excelsior .....	7.00	3.29	6.00
E. L. D. Special.....	7.00	2.47	3.00
Braswell's Special for Tobacco.....	7.00	2.26	3.50
Planters' Top Dresser .....	3.50	7.82	3.00
Nitrate of Soda .....	.....	15.00	.....
Ground Fish Scrap .....	.....	8.23	.....
Muriate of Potash .....	.....	.....	50.00
Sulphate of Potash .....	.....	.....	48.00
Genuine German Kainit .....	.....	.....	12.00

*Pocahontas Guano Co., Lynchburg, Va.—*

Pure Raw Bone Meal.....Total	22.00	3.71	.....
Carrington's S. C. Phosphate, Waukeshu Brand .....	16.00	.....	.....
Imperial Dissolved S. C. Phosphate.....	14.00	.....	.....
Indian Special Grain and Grass Guano.....	12.00	5.00	.....
Special Potash Mixture .....	10.00	5.00	.....
Wabash Wheat Mixture .....	10.00	4.00	.....
Carrington's Superior Grain Compound.....	10.00	2.00	.....
Pocahontas Special Tobacco Fertilizer.....	9.00	2.47	3.00
High Grade 4 Per Cent Tobacco Compound Mohawk King .....	9.00	1.85	4.00
Yellow Tobacco Special .....	9.00	1.65	2.00
Standard Tobacco Guano, Old Chief Brand...	9.00	1.65	2.00
Planters' Special .....	9.00	.82	2.00
Indian Tobacco Grower .....	8.00	2.47	4.00
Farmers' Favorite Apex Brand.....	8.00	2.47	3.00
Special Truck Grower, Eagle Mount Brand...	8.00	2.06	6.00
Spot Cash Tobacco Compound.....	8.00	2.05	3.00
Truckers' Special .....	8.00	1.65	6.00
Carrington's Banner Brand Guano.....	8.00	1.65	2.00
A. A. Complete Champion Brand .....	8.00	1.00	3.00
Cherokee Grain Special .....	8.00	.....	4.00
Nitrate of Soda .....	.....	15.00	.....
Muriate of Potash .....	.....	.....	49.00
Sulphate of Potash .....	.....	.....	48.00
Genuine German Kainit .....	.....	.....	12.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
<i>The Pocomoke Guano Co., Norfolk, Va.—</i>			
Pure Ground Bone .....Total	20.00	3.70	....
Superb Acid Phosphate .....	16.00	....	....
Peerless Acid Phosphate .....	14.00	....	....
Pocomoke 12-5 Bone and Potash.....	12.00	....	5.00
Alkali Bone .....	11.00	....	2.00
Pocomoke Bone and Potash Mixture .....	10.00	....	4.00
10-2 Potash Mixture .....	10.00	....	2.00
Monticello Animal Bone Fertilizer.....	9.00	1.85	4.00
Cinco Tobacco Guano .....	8.50	2.06	2.50
Pocomoke Superphosphate .....	8.50	1.65	2.00
Electric Crop Grower .....	8.50	1.65	2.00
Garrett's Grape Grower .....	8.00	3.29	10.00
Faultless Ammoniated Superphosphate .....	8.00	3.29	4.00
Pocomoke H. G. Tobacco Guano .....	8.00	3.29	4.00
Monarch Tobacco Grower .....	8.00	2.47	3.00
Harvey's High Grade Monarch .....	8.00	2.47	3.00
Pocomoke Sweet Potato Grower.....	8.00	2.47	3.00
CCC Crescent Complete Compound.....	8.00	1.65	3.00
Pamlico Superphosphate .....	8.00	1.65	2.00
Pocomoke Wheat, Corn and Peanut Manure..	8.00	1.00	4.00
Pocomoke Defiance Bone and Potash.....	8.00	....	4.00
Pocomoke Truck Grower 5 Per Cent.....	7.00	4.11	5.00
Standard Truck Guano .....	7.00	4.11	5.00
Seaboard Popular Trucker .....	6.00	5.76	5.00
Freeman's 7 Per Cent Irish Potato Grower...	6.00	5.76	5.00
Coast Line Truck Guano.....	5.00	8.23	3.00
Pocomoke Top Dresser .....	4.00	8.23	2.00
Smith's Special Formula .....	4.00	3.29	6.00
Nitrate of Soda .....	....	15.00	....
Dry Ground Fish .....	....	8.23	....
Special Top Dresser .....	....	7.41	3.00
Muriate of Potash .....	....	....	49.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00

*Powhatan Chemical Co., Richmond, Va.—*

Pure Animal Bone .....Total	25.00	2.47	....
Pure Raw Bone Meal.....Total	22.50	3.70	....
Magic Dissolved Bone Phosphate .....	16.00	....	....
High Grade Acid Phosphate.....	14.00	....	....
Powhatan Acid Phosphate .....	13.00	....	....
Magic Corn Special .....	12.00	1.00	2.00
Magic Wheat Special .....	12.00	1.00	2.00
High Grade Bone and Potash Mixture.....	12.00	....	5.00
Virginia Dissolved Bone .....	12.00	....	....
Magic Corn Grower .....	10.00	.82	1.00
Magic Crop Grower .....	10.00	.82	1.00
Magic Bone and Potash Mixture.....	10.00	....	4.00
Bone and Potash Mixture.....	10.00	....	2.00
Austin's Special Fertilizer .....	9.00	2.47	6.00
Guilford's Special Tobacco Fertilizer.....	9.00	2.47	6.00
Ralling's Special Fertilizer .....	9.00	2.47	2.00
Economic Cotton Grower .....	9.00	2.26	2.00
Johnson's Best Fertilizer .....	9.00	2.06	5.00
Holt's Magic Fertilizer .....	9.00	2.06	5.00
Union Magic Fertilizer .....	9.00	1.85	4.00
North Carolina Favorite .....	9.00	1.65	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Powhatan Special Fertilizer .....	9.00	1.65	2.00
Magic Mixture .....	9.00	1.65	1.00
Powhatan Grain Guano .....	9.00	.82	3.00
Magic Wheat Grower .....	9.00	.82	2.00
King Trucker .....	8.00	4.11	5.00
Tomlinson's Best Fertilizer .....	8.00	3.70	7.00
Copeland's Magic Fertilizer .....	8.00	3.29	8.00
Powhatan Special Tobacco Fertilizer .....	8.00	3.29	6.00
North State Special .....	8.00	3.29	4.00
Tomlinson's Favorite Fertilizer .....	8.00	2.88	5.00
Special Fertilizer .....	8.00	2.47	7.00
Tomlinson's Magic Fertilizer .....	8.00	2.47	7.00
Tomlinson's Special Fertilizer .....	8.00	2.47	5.00
Magic Fertilizer .....	8.00	2.47	4.00
P. C. Co.'s Hustler.....	8.00	2.47	3.00
Johnson's Special Fertilizer .....	8.00	2.47	3.00
King Brand Fertilizer .....	8.00	2.06	3.00
White Leaf Tobacco Fertilizer .....	8.00	2.06	3.00
Powhatan Peanut Fertilizer .....	8.00	1.65	4.00
Magic Cotton Grower .....	8.00	1.65	2.00
Magic Special Fertilizer .....	8.00	1.65	2.00
Magic Tobacco Grower .....	8.00	1.65	2.00
Magic Peanut Special .....	8.00	.82	4.00
Magic Grain Special .....	8.00	.82	4.00
Magic Peanut Grower .....	8.00	....	4.00
Magic Grain and Grass Grower.....	8.00	....	4.00
Powhatan Bone and Potash Mixture.....	8.00	....	4.00
Powhatan Trucker .....	7.00	4.94	5.00
Copeland's Best Fertilizer .....	7.00	2.88	7.00
Copeland's Special Fertilizer .....	6.00	3.29	7.00
Allen's Special Tobacco Fertilizer.....	6.00	1.65	5.00
Powhatan Top Dresser .....	4.00	8.23	4.00
Magic Top Dresser .....	4.00	6.17	2.50
Sulphate of Ammonia .....	....	19.75	....
Nitrate of Soda .....	....	15.63	....
Tomlinson Nitrate Muriate Special.....	....	9.87	5.00
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
High Grade German Potash.....	....	....	16.00
Pure German Kainit .....	....	....	12.00

*Rasin-Monumental Co., Baltimore, Md.—*

Rasin 16 Per Cent Acid Phosphate.....	16.00	....	....
Rasin Acid Phosphate .....	14.00	....	....
Rasin 13 Per Cent Acid Phosphate.....	13.00	....	....
Rasin H. G. Bone and Potash.....	12.00	....	5.00
Rasin's Big 10 .....	10.00	3.29	4.00
Rasin Seawall Alkaline Phosphate.....	10.00	....	6.00
Rasin Special Bone and Potash.....	10.00	....	5.00
Rasin's Double Bone and Potash.....	10.00	....	4.00
Rasin Bone and Potash.....	10.00	....	2.00
Rasin's Nine-Three-Three Guano .....	9.00	2.47	3.00
Rasin's Dixie Cotton Guano .....	9.00	2.26	2.00
Rasin Dixie Guano .....	9.00	1.65	2.00
Rasin's IXL (Cotton-seed Meal Body).....	9.00	.82	3.00
Baltimore Special Mixture .....	9.00	.82	2.00
Rasin's Dixie H. G. Guano.....	8.00	3.29	4.00
Rasin's Seawall Special Guano.....	8.00	2.47	5.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Rasin's Old Empire Guano Special.....	8.00	2.47	3.00
Rasin's Complete Cotton Compound.....	8.00	2.47	3.00
Rasin's Indian Brand for Tobacco.....	8.00	2.47	3.00
Rasin Gold Standard.....	8.00	2.47	3.00
Rasin Special Fertilizer.....	8.00	2.06	3.00
Rasin's General Tobacco Grower.....	8.00	2.06	3.00
Rasin's Old Empire Guano.....	8.00	1.65	2.00
Rasin's S-4 Bone and Potash.....	8.00	....	4.00
Rasin Irish Potato Special.....	7.00	3.29	8.00
Rasin Truckers' Mixture.....	6.00	5.77	5.00
Nitrate of Soda.....	....	14.82	....
Muriate of Potash.....	....	....	48.00
Sulphate of Potash.....	....	....	48.00
Rasin Genuine German Kainit.....	....	....	12.00

*Read Phosphate Co., Charleston, S. C.—*

Read's H. G. Dissolved Bone.....	16.00	....	....
Read's H. G. Acid Phosphate.....	14.00	....	....
Read's Bone and Potash.....	10.00	....	4.00
Read's Alkaline Bone.....	10.00	....	2.00
Read's Manipulated Guano.....	9.00	1.65	3.00
Read's H. G. Cotton Guano.....	8.00	4.12	7.00
Read's Ammoniated Dissolved Bone.....	8.00	3.30	6.00
Read's H. G. Guano.....	8.00	3.30	4.00
Read's H. G. Cotton Grower.....	8.00	2.47	3.00
Read's H. G. Tobacco Leaf.....	8.00	2.47	3.00
Read's Soluble Fish Guano.....	8.00	1.65	2.00
Read's Blood and Bone Fertilizer, No. 1.....	8.00	1.62	2.00
Read's Special Potash Mixture.....	8.00	....	4.00
Read's Fish and Blood Mixture.....	7.00	3.30	5.00
Nitrate of Soda.....	....	19.00	....
Muriate of Potash.....	....	....	48.00
German Kainit.....	....	....	12.00

*Red Cross Guano Co., Lynchburg, Va.—*

Pure Raw Bone Meal.....Total	22.00	3.71	....
Red Cross Bone Meal.....Total	22.00	3.00	....
Red Cross H. G. Phosphate.....	16.00	....	....
Red Cross Standard Phosphate.....	14.00	....	....
Red Cross Grain Grower.....	10.00	....	4.00
Red Cross Bone and Potash.....	10.00	....	2.00
Red Cross High Grade for Tobacco.....	9.00	2.47	3.00
Red Cross for Tobacco and Truck.....	9.00	1.85	4.00
Red Cross for Bright Tobacco.....	9.00	1.65	2.00
Red Cross Special for Tobacco.....	8.00	2.47	3.00
Red Cross Tobacco Guano.....	8.00	2.06	3.00
Red Cross Crop Grower.....	8.00	1.65	2.00
Red Cross Grain and Grass Special.....	8.00	1.00	3.00

*Rhum Phosphate Mining Co., Mount Pleasant, Pa.—*

Ground Phosphate Rock.....Total	28.00	....	....
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*Richmond Guano Co., Richmond, Va.—*

Pure Animal Bone.....Total	25.00	2.47	....
Pure Raw Bone Meal.....Total	22.50	3.70	....
Rex Dissolved Bone Phosphate.....	16.00	....	....
High Grade Acid Phosphate.....	14.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Premium Bone and Potash Mixture.....	13.00	....	3.00
Premium Dissolved Bone .....	13.00	....	....
Premium Corn Special .....	12.00	1.00	2.00
Premium Wheat Special .....	12.00	1.00	2.00
H. G. Bone and Potash Mixture.....	12.00	....	5.00
Regal Bone and Potash Mixture.....	12.00	....	4.00
Old Homestead Dissolved Bone.....	12.00	....	....
Dissolved S. C. Phosphate .....	12.00	....	....
Premium Corn Grower .....	10.00	.82	1.00
Bone Mixture .....	10.00	.82	1.00
Premium Crop Grower .....	10.00	.82	1.00
Johnson's Best Bone and Potash.....	10.00	....	5.00
Rex Bone and Potash Mixture .....	10.00	....	4.00
Bone and Potash Mixture.....	10.00	....	2.00
Sanders' Special Formula for Bright Tobacco.	9.00	2.88	5.00
Collins' Special Fertilizer .....	9.00	2.47	2.00
Carolina Cotton Grower .....	9.00	2.26	2.00
Burton Special Tobacco Fertilizer .....	9.00	2.06	3.00
C. & B.'s Best Fertilizer.....	9.00	1.65	3.00
Bumper Crop Ammoniated Guano.....	9.00	1.65	3.00
Lowery's Special Fertilizer .....	9.00	1.65	3.00
Cracker Jack Fertilizer .....	9.00	1.65	2.00
Bone Mixture .....	9.00	1.65	1.00
Tip Top Grain Guano.....	9.00	.82	3.00
Premium Wheat Grower .....	9.00	.82	2.00
Premium Crop Grower .....	9.00	.82	2.00
Southern Trucker .....	8.00	4.11	5.00
Bone and Blood Special for Tobacco.....	8.00	3.29	6.00
Special Fertilizer .....	8.00	3.29	6.00
Perfection Special .....	8.00	3.29	4.00
Beeson's Best Fertilizer .....	8.00	2.47	10.00
Carolina Bright Tobacco Fertilizer .....	8.00	2.47	3.00
Gilt Edge Fertilizer .....	8.00	2.47	3.00
Gilt Edge Tobacco Fertilizer .....	8.00	2.47	3.00
Carolina Bright Special Tobacco Fertilizer...	8.00	2.26	2.50
Tip Top Tobacco Fertilizer.....	8.00	2.06	3.00
Tip Top Fertilizer .....	8.00	2.06	3.00
Carolina Bright for Cotton.....	8.00	2.06	1.50
Special Premium Brand for Tobacco.....	8.00	1.85	2.25
Special Premium Brand for Plants .....	8.00	1.85	2.25
Beeson's Favorite Fertilizer .....	8.00	1.65	10.00
Beeson's Special Fertilizer .....	8.00	1.65	6.00
Rex Tobacco Fertilizer .....	8.00	1.65	4.00
Rex Ammoniated Crop Grower.....	8.00	1.65	3.00
Premium Cotton Fertilizer .....	8.00	1.65	2.00
Premium Tobacco Fertilizer .....	8.00	1.65	2.00
Premium Brand Fertilizer .....	8.00	1.65	2.00
Edgecombe Cotton Grower .....	8.00	1.65	2.00
Premium Grain Special .....	8.00	.82	4.00
Premium Peanut Special .....	8.00	.82	4.00
Premium Peanut Grower .....	8.00	....	4.00
Tip Top Bone and Potash Mixture.....	8.00	....	4.00
Winter Grain and Grass Grower.....	8.00	....	4.00
Clark's Special Formula .....	7.00	4.94	6.00
Special High Grade for Truck.....	7.00	4.94	5.00
10 Per Cent Cabbage Guano.....	6.00	8.23	2.00
Smith's 7 Per Cent Special.....	6.00	5.76	5.00
Edwards' Prolific Cotton Grower.....	6.00	3.29	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Gilt Edge Top Dresser .....	4.00	8.23	4.00
Premium Top Dresser .....	4.00	6.17	2.50
Carter's Special for Tobacco .....	4.00	2.47	6.00
Smith's Special Fertilizer .....	4.00	1.65	7.00
Sulphate of Ammonia .....	....	19.75	....
Nitrate of Soda .....	....	15.63	....
Special Top Dresser .....	....	7.40	3.00
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
High Grade German Potash.....	....	....	16.00
Pure German Kainit .....	....	....	12.00

*Robersonville Guano Co., Robersonville, N. C.—*

Roberson's H. G. Acid Phosphate.....	16.00	....	....
Roberson's 4 Per Cent Special.....	8.00	3.29	....
Roberson's H. G. Tobacco Grower.....	8.00	2.47	3.00
Roberson's H. G. Meal and Fish Guano.....	8.00	2.47	3.00
Roberson's H. G. Cotton Grower.....	8.00	2.47	3.00
Roberson's Special 7-7-7 Potato Grower.....	7.00	5.77	7.00
Roberson's H. G. Truck Guano .....	7.00	4.12	5.00
Roberson's 7 Per Cent Potato Guano.....	6.00	5.77	5.00
Robersonville H. G. Top Dresser.....	4.00	8.23	4.00
Sulphate of Ammonia .....	....	20.50	....
Nitrate of Soda .....	....	15.60	....
Dried Blood .....	....	13.62	....
Fish Scrap .....	....	8.00	....
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
Roberson's Genuine German Kainit.....	....	....	12.00

*Robeson Manufacturing Co., Lumberton, N. C.—*

Eureka .....	10.00	3.30	5.00
Stanby .....	8.00	3.30	4.00
Gold Dollar .....	8.00	3.30	4.00
Globe C. S. M. Guano.....	8.00	2.47	5.00
Bladen Special .....	8.00	2.47	4.00
Silver Dollar .....	8.00	2.47	3.00
Cottonade .....	8.00	2.27	3.00
Robeson's Special .....	8.00	1.65	3.00
Homerun .....	3.00	8.00	5.00

*The Robertson Fertilizer Co., Norfolk, Va.—*

Robertson's Raw Bone Meal.....Total	21.00	3.71	....
Robertson's Fine Ground Bone.....Total	21.00	2.47	....
High Peak Acid Phosphate.....	16.00	....	....
Scepter Brand Acid Phosphate .....	14.00	....	....
P. M. C. Acid Phosphate .....	13.00	....	....
J. W. S. Special Bone and Potash Mixture...	12.00	....	5.00
J. W. S. Alkaline Bone.....	10.00	....	5.00
Skyscraper Bone and Potash.....	10.00	....	4.00
Level Run Dissolved Bone and Potash.....	10.00	....	2.00
Beaver Brand Soluble Guano.....	9.00	1.85	4.00
Robertson's Blood and Bone Mixture .....	9.00	1.00	2.00
P. M. C. High Grade Soluble Guano.....	8.00	4.12	7.00
Robertson's 5-6-7 Guano .....	8.00	4.12	7.00
Wood's Winner H. G. Guano.....	8.00	3.30	4.00
Robertson's Soluble H. G. Guano .....	8.00	2.47	4.00
Old Kentucky High Grade Tobacco Manure..	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Robertson's Special Formula for Tobacco.....	8.00	2.47	3.00
Big Cropper High Grade Guano.....	8.00	2.47	3.00
Robertson's X-(T Ray) Tobacco Grower.....	8.00	2.06	2.00
Yellow Jacket Tobacco Guano.....	8.00	1.85	4.00
Double Dollar Tobacco Guano.....	8.00	1.65	2.00
Double Dollar Soluble Guano.....	8.00	1.65	2.00
Ten Strike Soluble Crop Grower.....	8.00	1.00	4.00
M. C. Special Bone and Potash Mixture.....	8.00	....	4.00
Robertson's 5 Per Cent Guano.....	7.00	4.12	5.00
Robertson's 7 Per Cent for Truck.....	6.00	5.76	5.00
Robertson's 10 Per Cent Truck Guano.....	2.00	8.25	2.00
Nitrate of Soda .....	....	14.85	....
Muriate of Potash .....	....	....	50.00
Genuine German Kainit .....	....	....	12.00

*F. S. Royster Guano Co., Norfolk, Va.—*

Pure Raw Bone Meal.....	Total	21.50	3.71	....
Arrow Brand Thomas Phosphate.....	Total	18.00	....	....
Royster's H. G. 17 Per Cent Acid Phosphate..		17.00	....	....
Royster's H. G. 16 Per Cent Acid Phosphate..		16.00	....	....
Royster's 14 Per Cent Acid Phosphate.....		14.00	....	....
Royster's Dissolved Bone .....		13.00	....	....
Royster's 12 and 5 Bone and Potash Mixture.		12.00	....	5.00
Royster's XX Acid Phosphate.....		12.00	....	....
Royster's 11 and 5 Bone and Potash Mixture.		11.00	....	5.00
Royster's Cotton Special .....		10.00	3.30	4.00
Seminole High Grade Fertilizer.....		10.00	2.47	3.00
Royster's Soluble Guano .....		10.00	1.65	2.00
Haywood County Special Guano.....		10.00	.82	3.00
Royster's 10 and 6 Bone and Potash Mixture.		10.00	....	6.00
Royster's 10 and 5 Bone and Potash Mixture.		10.00	....	5.00
Royster's 10 and 4 Bone and Potash Mixture.		10.00	....	4.00
Royster's Bone and Potash for Grain.....		10.00	....	3.00
Royster's Bone and Potash Mixture.....		10.00	....	2.00
Royster's 4-9-5 Special .....		9.00	3.30	5.00
Tomlinson's Special .....		9.00	2.47	5.00
Royster's 9-3-4 Special .....		9.00	2.47	4.00
Surry Special Tobacco Grower.....		9.00	2.47	3.00
Piedmont Special Cotton Grower.....		9.00	2.47	3.00
Royster's Meal Mixture .....		9.00	2.26	2.00
Royster's Cotton Grower .....		9.00	2.26	2.00
Viking Ammoniated Guano .....		9.00	1.65	3.00
Special Compound .....		9.00	1.65	1.00
Royster's Grain Grower .....		9.00	.82	3.00
Royster's Special 1-9-2 Guano.....		9.00	.82	2.00
Royster's Supreme Tobacco Guano.....		8.00	3.71	7.00
Royster's Best Guano .....		8.00	3.71	7.00
Cobb's High Grade for Tobacco.....		8.00	3.30	5.00
Cobb's H. G. for Cotton.....		8.00	3.30	5.00
Trucker's Delight .....		8.00	3.30	4.00
Jupiter High Grade Guano.....		8.00	3.30	4.00
Royster's H. G. Special Tobacco Guano.....		8.00	3.30	4.00
Milo Tobacco Guano .....		8.00	3.30	4.00
Royster's Special 4-8-3 Guano.....		8.00	3.30	3.00
Gorham's Special .....		8.00	3.30	2.50
Lenoir Special Tobacco Guano.....		8.00	2.88	7.00
Royster's Sovereign Tobacco Grower.....		8.00	2.88	5.00
Eagle's Special Tobacco Guano.....		8.00	2.47	5.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Marlboro High Grade Cotton Grower.....	8.00	2.47	3.00
Bonanza Tobacco Guano .....	8.00	2.47	3.00
Royster's Special Sweet Potato Guano.....	8.00	2.47	3.00
Orinoco Tobacco Guano .....	8.00	2.06	3.00
Special Tobacco Compound .....	8.00	2.06	2.00
Royster's Special Wheat Fertilizer.....	8.00	1.65	2.00
Royster's Complete Guano .....	8.00	1.65	2.00
Farmers' Bone Fertilizer .....	8.00	1.65	2.00
Webb's Korn King .....	8.00	1.65	2.00
Farmers' Bone Fertilizer for Tobacco.....	8.00	1.65	2.00
Jumbo Peanut Grower .....	8.00	1.02	4.00
Royster's 8 and 4 Bone and Potash Mixture..	8.00	....	4.00
Royster's Special 7 Per Cent Truck Guano...	7.00	5.77	7.00
Royster's Early Truck Guano.....	7.00	4.12	8.00
Royal Special Potato Guano.....	7.00	4.12	7.00
Royal Potato Guano .....	7.00	4.12	5.00
Royster's 7 and 5 Bone and Potash Mixture..	7.00	....	5.00
Royster's Peanut Special .....	7.00	....	5.00
Arrow Potato Guano .....	6.00	5.77	5.00
Royster's Irish Potato Guano.....	6.00	4.12	7.00
Yellow Bark Sweet Potato Guano.....	6.00	4.12	7.00
Royster's Special 5-6-5 .....	6.00	4.12	5.00
Pasquotank Potato Guano .....	6.00	3.30	8.00
Royster's Tobacco Manure .....	6.00	3.30	7.00
Oakley's Special Tobacco Guano.....	6.00	3.30	4.00
Royster's 2-6-5 Special .....	6.00	1.65	5.00
Royster's Special 10 Per Cent Truck Guano..	5.00	8.24	3.00
Royster's Cabbage Guano .....	5.00	8.22	2.50
Harvey's Cabbage Guano .....	5.00	6.59	3.00
Royster's Potato Guano .....	5.00	4.94	7.00
Presto Top Dresser .....	4.00	8.22	4.00
Royster's Ground Fish Scrap .....	4.00	8.22	....
Royster's Special Top Dresser.....	4.00	6.18	2.50
Royster's 4-6-4 Special .....	4.00	4.94	4.00
Currituck Sweet Potato Guano.....	4.00	2.47	8.00
Royster's Ground Fish Scrap.....	3.00	8.22	....
Royster's 10-2-5 Top Dresser.....	2.00	8.22	5.00
Nitrate of Soda .....	....	15.22	....
Magic Top Dresser .....	....	7.42	3.00
Cotton-seed Meal .....	....	6.17	....
Sulphate of Potash .....	....	....	48.00
Muriate of Potash .....	....	....	48.00
Manure Salts .....	....	....	20.00
Genuine German Kainit .....	....	....	12.00

*Scotland Neck Guano Co., Scotland Neck, N. C.—*

Our 16 Per Cent Acid Phosphate.....	16.00	....	....
Our Bone and Potash Mixture.....	10.00	....	4.00
Biggs' H. G. Truck Guano.....	8.00	4.12	5.00
Noah Biggs C. S. M. and Fish Scrap Guano..	8.00	3.30	4.00
Noah Biggs' Special Tobacco Guano.....	8.00	2.47	4.00
Johnson's Bright Leaf Tobacco Guano.....	8.00	2.47	3.00
State Farm C. S. M. and Fish Scrap Tobacco Guano .....	8.00	2.47	3.00
Farmers' C. S. M. and Fish Scrap Guano....	8.00	2.06	2.50
Our Special C. S. M. Guano.....	8.00	1.65	2.00
Johnson's Special Potato Guano.....	7.00	5.77	7.00
Our Best Peanut Guano.....	5.50	1.23	5.50

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
K. Elite Top Dressing.....	3.00	7.40	3.50
Nitrate of Soda .....	....	15.50	....
Noah Biggs Top Dresser.....	....	7.46	3.50
Our Genuine German Kainit.....	....	....	12.00

*The Southern Cotton Oil Co., Concord, Davidson,  
Shelby, Gibson, Monroe, and Wadesboro—*

S. C. O. Co.'s 16 Per Cent Acid Phosphate....	16.00	....	....
Gold Seal Acid Phosphate.....	14.00	....	....
Conqueror Bone and Potash.....	10.00	....	4.00
Magnolia Bone and Potash.....	10.00	....	2.00
King Bee .....	9.17	1.65	2.00
Adams' Favorite .....	9.00	2.47	4.50
Uncle Sam .....	9.00	2.47	3.00
Home Made .....	9.00	2.05	3.00
Razem .....	9.00	1.65	3.00
Special Grain Grower .....	9.00	.82	3.00
Special Ash Element .....	8.50	....	3.50
Choice .....	8.00	3.30	6.00
Conqueror .....	8.00	3.30	4.00
Canto .....	8.00	3.29	6.00
Melonite .....	8.00	3.29	4.00
Peacock .....	8.00	2.47	3.00
Moon .....	8.00	2.47	3.00
Landsake .....	8.00	2.47	2.50
Red Bull .....	8.00	2.06	2.00
All-to-Good .....	8.00	2.05	3.00
Gloria .....	8.00	1.65	2.00
Double Two .....	8.00	1.65	2.00
S. C. O. Co.'s Ash Element.....	7.50	....	4.50
Dandy Top Dresser .....	4.00	9.07	2.50
Peerless Top Dresser .....	4.00	6.17	2.50
Nitrate of Soda .....	....	15.00	....
Labi .....	....	8.99	17.00
Special Top Dresser .....	....	8.22	3.00
Muriate of Potash .....	....	....	48.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00

*The Southern Exchange Co., Marton, N. C.—*

S. E. C. Acid Phosphate.....	16.00	....	....
S. E. C. Acid Phosphate.....	14.00	....	....
S. E. C. Bone and Potash Mixture.....	10.00	....	4.00
S. E. C. Bone and Potash Mixture.....	10.00	....	2.00
Juicy Fruit Fertilizer .....	9.00	1.85	4.00
The Walnut Fertilizer .....	8.50	2.06	2.50
Melon Grower .....	8.00	4.11	7.00
McKimmon's Special Truck Formula.....	8.00	4.11	7.00
Two Fours Guano .....	8.00	3.29	4.00
Southern Exchange Co.'s Bright Tobacco Formula .....	8.00	2.47	4.00
That Big Stick Guano.....	8.00	2.47	4.00
Bull of the Woods Fertilizer.....	8.00	2.47	4.00
Marietta Supply Co.'s Best .....	8.00	2.47	3.00
Jack's Best Fertilizer .....	8.00	2.47	3.00
Correct Cotton Compound .....	8.00	2.47	3.00
R. M. C. Special Crop Grower.....	8.00	2.47	3.00
Clark's Special Compound .....	8.00	1.65	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Southern Exchange Co.'s Special Tobacco Fertilizer .....	8.00	1.65	3.00
Currie Crop Lifter .....	8.00	1.65	3.00
The Racer Guano .....	8.00	1.65	3.00
The Coon Guano .....	8.00	1.65	2.00
The Southern Exchange Co.'s Top Dresser...	4.00	8.23	2.00
Nitrate of Soda .....	....	15.00	....
Muriate of Potash .....	....	....	49.00
Gennine German Kainit .....	....	....	12.00

*Spartanburg Fertilizer Co., Spartanburg, S. C.—*

16 Per Cent Acid Phosphate.....	16.00	....	....
14 Per Cent Acidulated Phosphate.....	14.00	....	....
Staff of Life .....	13.00	.82	3.00
West's Potash Acid .....	13.00	....	3.00
13-3 Potash Acid .....	13.00	....	3.00
Nitro Blood .....	12.50	1.65	2.50
12-6 .....	12.00	....	6.00
Wheat Formula .....	11.50	1.21	5.00
Gosnell's Plant Food .....	10.50	2.46	2.00
N. C. Special .....	10.50	1.65	8.00
Corn Formula .....	10.50	1.65	5.00
King Tiger .....	10.00	1.65	3.00
10-4 .....	10.00	....	4.00
Dana's Best .....	10.00	....	4.00
Melrose .....	10.00	....	2.00
10-2 .....	10.00	....	2.00
Boll Buster .....	9.20	1.65	2.00
Grain Compound .....	9.20	1.65	2.00
Hummer .....	9.00	1.65	3.00
Tiger Brand .....	9.00	.82	3.00
Unaka .....	8.00	3.29	4.00
Glencoe .....	8.00	2.46	3.00
Corn Grower .....	8.00	1.65	2.00
Corn Maker .....	8.00	1.65	2.00
Corn King .....	8.00	1.65	2.00
C. C. & O. Special.....	8.00	1.65	2.00
Potato Guano .....	7.00	2.46	7.00
Sulphate Ammonia .....	....	20.65	....
Nitrate of Soda .....	....	14.81	....
Muriate of Potash .....	....	....	48.00
Kainit .....	....	....	12.00

*Swift Fertilizer Works, Atlanta, Ga., Wilmington, N. C., and Chester, S. C.—*

Swift's Raw Bone Meal.....Total	23.00	3.70	....
Swift's Pure Bone Meal.....Total	23.00	2.47	....
Swift's Special .....	16.00	....	....
Swift's Cultivator .....	14.00	....	....
Swift's Harrow .....	13.00	....	....
Swift's North Carolina Special.....	12.00	1.65	2.00
Swift's Special .....	12.00	....	6.00
Swift's Atlanta .....	12.00	....	4.00
Swift's Chattahoochee .....	12.00	....	....
Swift's Farmers' Special .....	10.00	3.29	4.00
Swift's Special High Grade Guano.....	10.00	3.29	3.00
Swift's Corn and Cotton Grower.....	10.00	2.47	3.00
Swift's Eagle .....	10.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Swift's Planfers' Special .....	10.00	.82	3.00
Swift's Plow Boy .....	10.00	.82	1.00
Swift's Atlanta .....	10.00	....	5.00
Swift's Farmers' Home .....	10.00	....	4.00
Swift's Field and Farm .....	10.00	....	2.00
Swift's Wheat Grower .....	10.00	....	2.00
Swift's Special .....	9.50	4.12	3.00
Swift's Blood, Bone and Potash.....	9.50	3.29	7.00
Swift's Champion .....	9.00	2.47	4.00
Swift's Special Cotton Grower .....	9.00	2.47	3.00
Swift's Cotton King .....	9.00	2.47	2.00
Swift's Special Cotton Guano .....	9.00	2.26	2.00
Swift's Gold Medal .....	9.00	1.65	3.00
Swift's Farmers' Favorite .....	9.00	1.65	3.00
Swift's Cotton Plant .....	9.00	1.65	1.00
Swift's Special .....	9.00	.82	3.00
Swift's Special Formula .....	9.00	.82	2.00
Swift's Cape Fear .....	8.00	4.12	3.00
Swift's Special Tobacco Grower High Grade.	8.00	3.29	6.00
Swift's Majestic for Tobacco High Grade....	8.00	3.29	4.00
Swift's Monarch .....	8.00	3.29	4.00
Swift's Cotton-seed Meal Compound .....	8.00	3.29	4.00
Swift's Quick Growth Tobacco Fertilizer....	8.00	3.29	2.00
Swift's Strawberry Grower .....	8.00	2.47	10.00
Swift's Piedmont Tobacco Grower .....	8.00	2.47	6.00
Swift's Carter's Prolific .....	8.00	2.47	4.00
Swift's Carolina Tobacco Grower .....	8.00	2.47	3.00
Swift's Ruralist .....	8.00	2.47	3.00
Swift's Cotton-seed Meal Compound .....	8.00	2.47	3.00
Swift's Gold Leaf Tobacco Grower .....	8.00	2.06	3.00
Swift's Braswell Formula .....	8.00	2.06	2.50
Swift's Sumatra Tobacco Grower .....	8.00	2.06	2.00
Swift's Bright Leaf Tobacco Grower.....	8.00	1.65	5.00
Swift's Pioneer Tobacco Grower .....	8.00	1.65	4.00
Swift's Clark's Special Cotton Grower.....	8.00	1.65	3.00
Swift's Red Steer .....	8.00	1.65	2.00
Swift's Golden Harvest .....	8.00	1.65	2.00
Swift's Thompson's Special .....	8.00	.82	5.00
Swift's Special Peanut Grower .....	8.00	.82	4.00
Swift's Golden Grain Grower .....	8.00	.82	4.00
Swift's Golden Grain Grower .....	8.00	.82	4.00
Swift's Plantation .....	8.00	....	4.00
Swift's Carolina 7 Per Cent Special Trucker.	7.00	5.76	7.00
Swift's Special Irish Potato Grower.....	7.00	4.12	8.00
Swift's Potato Grower .....	7.00	4.12	7.00
Swift's Early Trucker .....	7.00	4.12	5.00
Swift's Special High Grade .....	7.00	3.29	5.00
Swift's Special Trucker .....	6.00	5.76	5.00
Swift's Favorite Truck Guano .....	6.00	4.94	6.00
Swift's Special Potato Grower .....	6.00	4.12	7.00
Swift's Special Tobacco Grower .....	6.00	3.29	6.00
Swift's Special 10 Per Cent Blood and Bone Trucker .....	5.00	8.23	3.00
Swift's Superior Top Dresser .....	5.00	8.23	3.00
Swift's Plant Bed Tobacco Fertilizer.....	5.00	6.58	2.00
Swift's Fruiter Top Dresser .....	5.00	4.94	2.50
Swift's Special Top Dresser .....	4.00	8.23	4.00
Swift's Excelsior Top Dresser .....	4.00	6.18	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Swift's Everett's Special Formula .....	4.00	3.29	3.00
Swift's No. 1 Ground Tankage.....	3.50	9.06	....
Swift's Pure Nitrate of Soda.....	....	14.82	....
Swift's Ground Dried Blood .....	....	13.18	....
Swift's Special Top Dresser .....	....	8.23	4.00
Cotton-seed Meal .....	....	7.50	....
Swift's Special Top Dresser .....	....	7.40	4.00
Swift's Nitrogen and Potash, No. 1.....	....	7.40	3.00
Swift's Nitrogen and Potash, No. 2.....	....	6.58	4.00
Swift's Cotton-seed Meal High Grade.....	....	6.18	....
Swift's Muriate of Potash .....	....	....	50.00
Swift's Sulphate of Potash .....	....	....	49.00
Swift's Pure German Kainit .....	....	....	12.00
<i>Tidewater Guano Co., Norfolk, Va.—</i>			
Thomas Phosphate .....	17.00	....	....
B. B. Yellow Tobacco Grower.....	8.00	2.47	3.00
<i>Tuscarora Fertilizer Co., Atlanta, Ga., and Wil- mington, N. C.—</i>			
Tuscarora High Grade Trucker.....	6.00	4.11	7.00
<i>Union Abattoir Co., Norfolk, Va., and New Bern, N. C.—</i>			
Acid Phosphate .....	16.00	....	....
Acid Phosphate .....	14.00	....	....
Red Star Potash and Soluble Bone.....	10.00	....	4.00
Johnson's High Grade .....	9.00	2.06	5.00
Red Star H. G. Guano.....	8.75	2.00	2.00
Cotton Guano .....	8.00	3.28	4.00
Red Star Cotton Guano .....	8.00	2.50	1.00
Cotton and Tobacco Guano .....	8.00	2.46	3.00
Standard Guano .....	8.00	1.65	2.00
Muriate of Potash .....	....	....	50.00
Kainit .....	....	....	12.00
<i>Union Guano Co., Winston-Salem, N. C.—</i>			
Pure Raw Animal Bone Meal.....	20.60	3.71	....
Union 16 Per Cent Acid Phosphate.....	16.00	....	....
Union High Grade Acid Phosphate.....	14.00	....	....
Dissolved Animal Bone Meal.....	13.00	2.06	....
Union Dissolved Bone .....	13.00	....	....
Union 12-6 Bone and Potash.....	12.00	....	6.00
Union 12-5 Bone and Potash.....	12.00	....	5.00
Union 12-4 Bone and Potash.....	12.00	....	4.00
Union 12-3 Bone and Potash.....	12.00	....	3.00
Union 12-2 Bone and Potash.....	12.00	....	2.00
Union 12 Per Cent Acid Phosphate.....	12.00	....	....
Liberty Bell Crop Grower.....	10.50	....	1.50
Union Prolific Cotton Compound.....	10.00	3.29	4.00
Union Special Formula for Cotton.....	10.00	2.47	3.00
Union Mule Brand Guano.....	10.00	1.65	2.00
Grain Chemicals .....	10.00	1.03	6.00
Union 10-6 Bone and Potash .....	10.00	....	6.00
Union 10-5 Bone and Potash .....	10.00	....	5.00
Union 10-4 Bone and Potash.....	10.00	....	4.00
Quakers Grain Mixture .....	10.00	....	4.00
Giant Phosphate and Potash .....	10.00	....	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Finch & Harris's Special Bone and Potash Mixture .....	10.00	....	3.00
Union Bone and Potash.....	10.00	....	2.00
Union Gold Leaf Tobacco Mixture.....	9.00	3.00	6.00
Union Renown Guano .....	9.00	2.47	3.00
Union Complete Cotton Mixture .....	9.00	1.65	3.00
Farmers' Blood and Bone Guano .....	9.00	1.65	3.00
Dixie Cotton Grower .....	9.00	1.65	2.00
Q. and Q. (Quality and Quantity) Guano.....	9.00	1.65	1.00
B. S. Ammoniated Guano.....	9.00	.82	3.00
Union Guano for Tobacco.....	8.00	3.29	6.00
Union Premium Guano .....	8.00	3.29	4.00
Bright Leaf Tobacco Compound .....	8.00	2.75	7.00
Union Homestead Guano .....	8.00	2.47	3.00
Victoria High Grade Tobacco Fertilizer.....	8.00	2.47	3.00
Union Water Fowl Guano.....	8.00	2.06	3.00
Union Standard Tobacco Grower .....	8.00	2.06	2.00
Union Potato Mixture .....	8.00	1.65	10.00
Old Honesty Guano .....	8.00	1.65	2.00
Fish Brand Ammoniated Guano for Tobacco..	8.00	1.65	2.00
Old Honesty Tobacco Guano .....	8.00	1.65	2.00
Fish Brand Ammoniated Guano .....	8.00	1.65	2.00
Union Superlative Guano .....	8.00	.82	4.00
Sunrise Ammoniated Guano .....	8.00	.82	3.00
Union 8-5 Bone and Potash.....	8.00	....	5.00
Union Wheat Mixture .....	8.00	....	4.00
Union Vegetable Compound .....	7.00	4.12	8.00
Union Truck Guano .....	7.00	3.29	5.00
Complete Mixture for Top Dressing.....	4.00	6.18	4.00
Special 10 Per Cent Top Dresser.....	2.00	8.24	2.50
Nitrate of Soda .....	....	14.82	....
Union Top Dresser Ammonia and Potash Mixture .....	....	7.42	3.00
Cotton-seed Meal .....	....	6.18	....
Muriate of Potash .....	....	....	48.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00

*United States Fertilizer Co., Baltimore, Md.—*

Raw Bone Meal .....	Total	22.50	3.69	....
Farm Bell Acid Phosphate.....		16.00	....	....
Farm Bell Acid Phosphate.....		14.00	....	....
Farm Bell Phospho Potassa.....		12.00	....	5.00
Farm Bell Potash and Acid.....		10.00	....	6.00
Farm Bell 10-5 Mixture .....		10.00	....	5.00
Farm Bell Special Mixture.....		10.00	....	4.00
Farm Bell Alkaline Mixture .....		10.00	....	2.00
Farm Bell Big Yield.....		9.00	2.47	4.00
White Oak Mountain Tobacco Guano .....		9.00	2.46	3.00
Farm Bell Harvest Moon .....		9.00	.82	3.00
Farm Bell Buckeye Guano.....		9.00	.82	2.00
Farm Bell Blood, Bone and Potash.....		8.00	4.11	7.00
Farm Bell Excelsior Guano .....		8.00	3.28	7.00
Farm Bell Majestic Guano.....		8.00	3.28	4.00
Farm Bell Tobacco Fertilizer.....		8.00	2.47	4.00
Farm Bell Cotton Special.....		8.00	2.47	3.00
Farm Bell Tobacco Special.....		8.00	2.47	3.00
Farm Bell Crop Grower .....		8.00	2.06	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Farm Bell Tomato Special.....	8.00	2.05	3.00
Farm Bell Tobacco Grower.....	8.00	2.05	3.00
Farm Bell Fruit and Potato Guano.....	8.00	1.65	10.00
Farm Bell Animal Ammoniated.....	8.00	1.65	5.00
Farm Bell Standard Guano.....	8.00	1.65	2.00
Farm Bell Standard for Tobacco.....	8.00	1.65	2.00
Farm Bell Wheat, Oat, Corn Special.....	8.00	.82	6.00
Farm Bell Pennant Winner.....	8.00	.82	4.00
Farm Bell Phosphate and Potash.....	8.00	....	5.00
Farm Bell Wheat and Grass Grower.....	8.00	....	4.00
Farm Bell Truckers' Ideal.....	7.00	4.11	8.00
Farm Bell Potato and Tobacco Guano.....	7.00	2.47	10.00
Farm Bell Klimax Compound.....	7.00	.82	4.00
Farm Bell 7 Per Cent Trucker.....	6.00	5.75	5.00
Farm Bell Truckers' Favorite.....	6.00	3.28	8.00
Farm Bell Lightning Topper.....	4.00	8.20	3.00
Farm Bell Top Dresser.....	4.00	6.58	2.00
Sulphate of Ammonia.....	....	20.50	....
Nitrate of Soda.....	....	15.50	....
Sulphate of Potash.....	....	....	50.00
Muriate of Potash.....	....	....	48.00
Kainit.....	....	....	12.00

*Vance Guano Co., Henderson, N. C.—*

Best Grade Acid Phosphate.....	16.00	....	....
Vance High Grade Acid Phosphate.....	14.00	....	....
Vance Corn and Grain Grower.....	10.00	1.00	3.50
Farmers' Union.....	9.00	3.00	3.00
Brodie's Best.....	8.00	4.00	4.00
Fish Brand Tobacco Manure.....	8.00	3.00	3.00
Sterling Cotton Grower.....	8.00	2.00	2.00
Hot Stuff.....	8.00	2.00	2.00
Vance Top Dresser.....	3.00	10.00	5.00

*Venable Fertilizer Co., Richmond, Va.—*

Pure Animal Bone.....Total	25.00	2.47	....
Pure Raw Bone Meal.....Total	22.50	3.70	....
Venable Best Acid Phosphate.....	16.00	....	....
H. G. Acid Phosphate.....	14.00	....	....
Venable's Dissolved Bone.....	13.00	....	....
Venable's Majestic Bone and Potash Mixture.....	12.00	....	5.00
Venable's Standard Acid Phosphate.....	12.00	....	....
Venable's Corn, Wheat and Grass Fertilizer.....	10.00	.82	1.00
High Grade Bone and Potash Mixture.....	10.00	....	4.00
Bone and Potash Mixture.....	10.00	....	2.00
Venable Carolina Favorite.....	9.00	2.47	6.00
Venable's 3-9-3 Tobacco Fertilizer.....	9.00	2.47	3.00
Roanoke Mixture.....	9.00	2.26	2.00
Roanoke Meal Mixture.....	9.00	2.26	2.00
Venable's Majestic Guano.....	9.00	1.65	3.00
Venable's B. B. P. Manure.....	9.00	1.65	1.00
Majestic Grain Guano.....	9.00	.82	3.00
Venable's Wheat Grower.....	9.00	.82	2.00
Venable's 5 Per Cent Trucker.....	8.00	4.11	5.00
Venable's Special Tobacco Fertilizer.....	8.00	3.29	6.00
Venable's Sovereign Guano.....	8.00	3.29	4.00
Venable's 4 Per Cent Trucker.....	8.00	3.29	4.00
Venable's H. G. Tobacco Fertilizer.....	8.00	2.47	3.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Farmers' Union H. G. Tobacco Guano.....	8.00	2.47	3.00
Venable's Choice Fertilizer .....	8.00	2.47	3.00
Venable's H. G. Cotton Guano.....	8.00	2.47	3.00
Venable's Alliance Tobacco Manure, No. 1...	8.00	2.06	3.00
Venable's Cotton Grower .....	8.00	2.06	3.00
Venable's Roanoke Special .....	8.00	2.06	3.00
Venable's Ideal Manure .....	8.00	1.65	5.00
Our Union Tobacco Fertilizer.....	8.00	1.65	4.00
Farmers' Union Special Tobacco Fertilizer...	8.00	1.65	2.00
Venable's Meal Mixture .....	8.00	1.65	2.00
Venable's Alliance Tobacco Manure, No. 2....	8.00	1.65	2.00
Our Union Special Fertilizer.....	8.00	1.65	2.00
Planter's Bone Fertilizer .....	8.00	1.65	2.00
Venable's Peanut Special .....	8.00	.82	4.00
Venable's Grain Special .....	8.00	.82	4.00
Venable's Alliance Bone and Potash Mixture.	8.00	....	4.00
Venable's Peanut Grower .....	8.00	....	4.00
Venable's 10 Per Cent Trucker.....	6.00	8.23	2.00
Venable's 6-6-6 Manure .....	6.00	4.94	6.00
Venable's Top Dresser .....	4.00	8.23	4.00
Majestic Top Dresser .....	4.00	6.17	2.50
Sulphate of Ammonia .....	....*	19.75	....
Nitrate of Soda .....	....	15.63	....
Special Top Dresser .....	....	7.40	3.00
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
High Grade German Potash.....	....	....	16.00
Pure German Kainit .....	....	....	12.00

*Virginia-Carolina Chemical Co., Richmond, Va.—*

V.-C. C. Co.'s Floats .....	Total	27.00	....	....
V.-C. C. Co.'s Concentrated Acid Phosphate...		24.00	....	....
V.-C. C. Co.'s Pure Raw Bone.....	Total	20.60	3.71	....
V.-C. C. Co.'s Johnson's Best.....		20.00	4.94	6.00
V.-C. C. Co.'s Concentrated Bone and Potash.		20.00	....	4.00
V.-C. C. Co.'s 17 Per Cent Acid Phosphate....		17.00	....	....
V.-C. C. Co.'s Star Brand Ground Slag.....		17.00	....	....
V.-C. C. Co.'s Concentrated Ammoniated....		16.00	3.29	4.00
V.-C. C. Co.'s Climax Potash Mixture.....		16.00	....	2.00
V.-C. C. Co.'s Alliance Acid Phosphate.....		16.00	....	....
V.-C. C. Co.'s 16 Per Cent Acid Phosphate....		16.00	....	....
V.-C. C. Co.'s Sludge Acid Phosphate.....		14.00	....	....
V.-C. C. Co.'s 14 Per Cent Acid Phosphate...		14.00	....	....
V.-C. C. Co.'s Dissolved Animal Bone...Total		13.00	2.06	....
V.-C. C. Co.'s 13 Per Cent Acid Phosphate....		13.00	....	....
V.-C. C. Co.'s Special High Grade Potash Mix- ture .....		12.00	....	6.00
V.-C. C. Co.'s H. G. Potash Mixture.....		12.00	....	5.00
V.-C. C. Co.'s Goodman's Special Potash Mix- ture .....		12.00	....	5.00
V.-C. C. Co.'s 12-4 Grain Grower.....		12.00	....	4.00
V.-C. C. Co.'s Wythe County Potash Mixture.		12.00	....	3.00
V.-C. C. Co.'s Special Crop Grower.....		12.00	....	3.00
V.-C. C. Co.'s Battle's Crop Grower.....		12.00	....	3.00
V.-C. C. Co.'s 12 Per Cent Acid Phosphate....		12.00	....	....
V.-C. C. Co.'s Home Comfort Acid Phosphate.		12.00	....	....
V.-C. C. Co.'s Virginia 11-5 Bone and Potash.		11.00	....	5.00
V.-C. C. Co.'s Electric H. G. Special.....		10.00	3.29	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
V.-C. C. Co.'s Ideal Crop Grower.....	10.00	2.47	3.00
V.-C. C. Co.'s Special Grain Mixture.....	10.00	1.65	5.00
V.-C. C. Co.'s Sovereign Crop Producer.....	10.00	1.65	2.00
V.-C. C. Co.'s H. G. Southern Fertilizer Com- panies Scott's Gossypium Phospho.....	10.00	1.05	2.00
V.-C. C. Co.'s Ford's Wheat and Corn Guano.	10.00	.82	2.50
V.-C. C. Co.'s Grain Special.....	10.00	....	6.00
V.-C. C. Co.'s Standard Bone and Potash.....	10.00	....	5.00
V.-C. C. Co.'s Crescent Potash Mixture.....	10.00	....	5.00
V.-C. C. Co.'s Special Potash Mixture.....	10.00	....	4.00
V.-C. C. Co.'s Dissolved Bone and Potash....	10.00	....	2.00
V.-C. C. Co.'s Best's H. G. Tobacco Fertilizer.	9.00	2.47	7.00
V.-C. C. Co.'s Great Texas Cotton Grower Sol- uble Guano .....	9.00	2.47	4.00
V.-C. C. Co.'s 3-9-3 Tobacco Fertilizer.....	9.00	2.47	3.00
V.-C. C. Co.'s Jeffrey's High Grade Guano....	9.00	2.47	3.00
V.-C. C. Co.'s N. and R.'s Best.....	9.00	2.47	3.00
V.-C. C. Co.'s Westfield Special H. G. Tobacco Grower .....	9.00	2.47	3.00
V.-C. C. Co.'s Grey Soil Special H. G. Tobacco Grower .....	9.00	2.47	3.00
V.-C. C. Co.'s Powell's Special H. G. C. S. M...	9.00	2.26	3.00
V.-C. C. Co.'s Southern Cotton Grower C. S. M.	9.00	2.26	2.00
V.-C. C. Co.'s Vececo Cotton Grower C. S. M..	9.00	2.26	2.00
V.-C. C. Co.'s Cotton Grower.....	9.00	2.26	2.00
V.-C. C. Co.'s Best's Special Cotton Grower...	9.00	2.26	2.00
V.-C. C. Co.'s Prolific Cotton Grower C. S. M.	9.00	2.26	2.00
V.-C. C. Co.'s White Stem C. S. M.....	9.00	2.26	2.00
V.-C. C. Co.'s Standard Cotton Grower C. S. M.	9.00	2.26	2.00
V.-C. C. Co.'s Cotton Grower.....	9.00	2.26	2.00
V.-C. C. Co.'s Bumper Crop Grower.....	9.00	2.06	5.00
V.-C. C. Co.'s Cuban Special Mixture.....	9.00	1.85	4.00
V.-C. C. Co.'s Cock's Soluble Guano H. G. Ani- mal Bone .....	9.00	1.85	3.00
V.-C. C. Co.'s No. 923 Guano.....	9.00	1.65	3.00
V.-C. C. Co.'s Reliable Cotton Brand Fertilizer	9.00	1.65	3.00
V.-C. C. Co.'s North State Guano C. S. M....	9.00	1.65	1.00
V.-C. C. Co.'s Grain Mixture.....	9.00	1.03	2.00
V.-C. C. Co.'s Bigelow's Crop Guano.....	9.00	.82	3.00
V.-C. C. Co.'s Burnhardt's Grain and Crop Guano .....	9.00	.82	3.00
V.-C. C. Co.'s McCormick's Wheat and Grain Guano .....	9.00	.82	3.00
V.-C. C. Co.'s Baltimore Special Mixture.....	9.00	.82	2.00
V.-C. C. Co.'s Farmer's Friend Favorite Fer- tilizer Special .....	8.50	1.65	2.00
V.-C. C. Co.'s Powhatan Crop Mixture.....	8.50	1.65	1.50
V.-C. C. Co.'s Pelican Peruvian Guano (Peli- can Truck Grower and Top Dresser).....	8.00	4.12	5.00
V.-C. C. Co.'s Muse's Special.....	8.00	3.70	7.00
V.-C. C. Co.'s Enterprise High Grade.....	8.00	3.29	11.00
V.-C. C. Co.'s Long Leaf Tobacco Grower....	8.00	3.29	5.00
V.-C. C. Co.'s Old Dominion Special Mixture for Tobacco .....	8.00	3.29	4.00
V.-C. C. Co.'s Alliance H. G. Manure.....	8.00	3.29	4.00
V.-C. C. Co.'s Fish and Meal Mixture.....	8.00	3.29	4.00
V.-C. C. Co.'s Carr's Crop Grower.....	8.00	3.29	4.00
V.-C. C. Co.'s Farmers' Choice.....	8.00	3.29	4.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
V.-C. C. Co.'s John F. Croom & Bro. Fish and Meal Mixture .....	8.00	3.29	4.00
V.-C. C. Co.'s Special .....	8.00	3.29	4.00
V.-C. C. Co.'s Nowell & Richardson's Special..	8.00	3.29	4.00
V.-C. C. Co.'s Croom's Crop Grower, Best for All Crops .....	8.00	3.29	4.00
V.-C. C. Co.'s Formula 161 for Tobacco.....	8.00	3.29	4.00
V.-C. C. Co.'s High Grade Tobacco Fertilizer..	8.00	2.47	10.00
V.-C. C. Co.'s Valentine Special.....	8.00	2.47	7.00
V.-C. C. Co.'s Special Mixture .....	8.00	2.47	6.00
V.-C. C. Co.'s Excelsior H. G. Special.....	8.00	2.47	5.00
V.-C. C. Co.'s Lion's High Grade Tobacco Fertilizer .....	8.00	2.47	4.00
V.-C. C. Co.'s Farmers' Success.....	8.00	2.47	4.00
V.-C. C. Co.'s Myatt's Special H. G. Fertilizer.	8.00	2.47	3.00
V.-C. C. Co.'s Alliance Special Fertilizer.....	8.00	2.47	3.00
V.-C. C. Co.'s Croom's Special Cotton Fertilizer, Fish and Meal Mixture.....	8.00	2.47	3.00
V.-C. C. Co.'s Menhaden Fish and Meal Mixture .....	8.00	2.47	3.00
V.-C. C. Co.'s Best's H. G. Cotton and Tobacco Guano .....	8.00	2.47	3.00
V.-C. C. Co.'s Diamond C. S. M. ....	8.00	2.47	3.00
V.-C. C. Co.'s Jumbo Peruvian Guano, Jumbo Crop Grower .....	8.00	2.47	3.00
V.-C. C. Co.'s Oldham's Special Compound for Tobacco, High Grade .....	8.00	2.47	3.00
V.-C. C. Co.'s Blake's Best.....	8.00	2.47	3.00
V.-C. C. Co.'s Royal High Grade Fertilizer ...	8.00	2.47	3.00
V.-C. C. Co.'s Special High Grade Tobacco Fertilizer C. S. M. ....	8.00	2.47	3.00
V.-C. C. Co.'s Adams' Special.....	8.00	2.47	3.00
V.-C. C. Co.'s Peruvian H. G. Tobacco Guano.	8.00	2.47	3.00
V.-C. C. Co.'s Red Cliff H. G. Cotton Grower..	8.00	2.47	3.00
V.-C. C. Co.'s Zeno Special Compound for Tobacco H. G. ....	8.00	2.47	3.00
V.-C. C. Co.'s 3-8-3 Tobacco Fertilizer.....	8.00	2.47	3.00
V.-C. C. Co.'s Gold Medal H. G. Tobacco Guano	8.00	2.47	3.00
V.-C. C. Co.'s Blake's H. G. Cotton and Tobacco Guano .....	8.00	2.47	3.00
V.-C. C. Co.'s Atlas Guano C. S. M. ....	8.00	2.47	2.50
V.-C. C. Co.'s Admiral C. S. M. ....	8.00	2.47	2.50
V.-C. C. Co.'s Good Luck C. S. M. ....	8.00	2.47	2.50
V.-C. C. Co.'s Split Silk C. S. M. ....	8.00	2.47	2.50
V.-C. C. Co.'s 3 Per Cent Special C. S. M. Guano, No. 3 .....	8.00	2.47	2.00
V.-C. C. Co.'s Orange Grove Guano.....	8.00	2.26	2.50
V.-C. C. Co.'s Delta C. S. M. Guano.....	8.00	2.26	2.50
V.-C. C. Co.'s Royal Crown.....	8.00	2.26	2.00
V.-C. C. Co.'s Superlative C. S. M. Guano....	8.00	2.06	3.00
V.-C. C. Co.'s Blue Star C. S. M. ....	8.00	2.06	3.00
V.-C. C. Co.'s Potato and Cabbage Special....	8.00	1.65	10.00
V.-C. C. Co.'s Smith's Irish Potato Guano....	8.00	1.65	10.00
V.-C. C. Co.'s Pace's 5 Per Cent Special Potato Guano .....	8.00	1.65	5.00
V.-C. C. Co.'s Bone Favorite.....	8.00	1.65	5.00
V.-C. C. Co.'s Monarch Brand.....	8.00	1.65	5.00
V.-C. C. Co.'s Boon's Favorite.....	8.00	1.65	5.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
V.-C. C. Co.'s Valley Pride .....	8.00	1.65	4.00
V.-C. C. Co.'s Corn and Peanut Special.....	8.00	1.65	4.00
V.-C. C. Co.'s Maultsby's Fish Guano.....	8.00	1.65	3.00
V.-C. C. Co.'s Alliance Grain Fertilizer.....	8.00	1.65	2.00
V.-C. C. Co.'s Winston Special for Cotton....	8.00	1.65	2.00
V.-C. C. Co.'s Diamond Dust C. S. M. ....	8.00	1.65	2.00
V.-C. C. Co.'s Plant Food C. S. M. ....	8.00	1.65	2.00
V.-C. C. Co.'s Wilson's Standard C. S. M. ....	8.00	1.65	2.00
V.-C. C. Co.'s Ajax C. S. M. Guano.....	8.00	1.65	2.00
V.-C. C. Co.'s Farmers' Favorite Fertilizer C. S. M. ....	8.00	1.65	2.00
V.-C. C. Co.'s Monarch Wheat and Grass Grower .....	8.00	1.00	7.00
V.-C. C. Co.'s Special Peanut Grower.....	8.00	1.00	4.00
V.-C. C. Co.'s Electric Grain and Grass Grower	8.00	1.00	4.00
V.-C. C. Co.'s Peerless Corn, Wheat and Grass Grower .....	8.00	1.00	4.00
V.-C. C. Co.'s Peanut Grower.....	8.00	.82	4.00
V.-C. C. Co.'s The Harvester.....	8.00	.82	3.00
V.-C. C. Co.'s Pinnacle Grain Grower.....	8.00	.82	3.00
V.-C. C. Co.'s S-5 Potash Mixture.....	8.00	....	5.00
V.-C. C. Co.'s Potash Mixture for Peanuts....	8.00	....	4.00
V.-C. C. Co.'s Jones' Grain Special .....	8.00	....	4.00
V.-C. C. Co.'s Special Wheat Compound .....	8.00	....	4.00
V.-C. C. Co.'s Truck Crop Fertilizer.....	7.00	4.12	7.00
V.-C. C. Co.'s Konqueror H. G. Truck Fertil- izer .....	7.00	4.12	5.00
V.-C. C. Co.'s Pasquotank Trucker.....	7.00	3.29	8.00
V.-C. C. Co.'s Potash Potato Producer.....	7.00	3.29	8.00
V.-C. C. Co.'s Formula 44 for Bright Wrappers and Smokers .....	7.00	2.55	3.20
V.-C. C. Co.'s Plant Bed and High Grade To- bacco Fertilizer .....	7.00	2.26	6.00
V.-C. C. Co.'s Invincible High Grade Fertilizer	6.00	4.12	7.00
V.-C. C. Co.'s Kitty Hawk Truck Fertilizer....	6.00	4.12	7.00
V.-C. C. Co.'s Special Truck Guano.....	6.00	4.12	7.00
V.-C. C. Co.'s Money Maker for Cabbage and Potatoes .....	6.00	1.65	10.00
V.-C. C. Co.'s Clinton Special H. G. ....	5.00	2.47	5.00
V.-C. C. Co.'s 10 Per Cent Top Dresser Extra H. G. ....	4.00	8.24	4.00
V.-C. C. Co.'s Fish Scrap.....	4.00	8.24	....
V.-C. C. Co.'s Dewberry Special.....	4.00	6.59	....
V.-C. C. Co.'s Dewberry Special Extra H. G. ..	4.00	6.56	4.00
V.-C. C. Co.'s High Grade Top Dresser.....	4.00	6.17	2.50
V.-C. C. Co.'s Sulphate of Ammonia.....	....	20.59	....
V.-C. C. Co.'s Nitrate of Soda.....	....	14.82	....
V.-C. C. Co.'s Blood.....	....	13.18	....
V.-C. C. Co.'s Special Top Dresser .....	....	7.41	3.00
V.-C. C. Co.'s Cotton-seed Meal .....	....	6.15	....
V.-C. C. Co.'s Muriate of Potash .....	....	....	48.00
V.-C. C. Co.'s Sulphate of Potash.....	....	....	48.00
V.-C. C. Co.'s Manure Salts.....	....	....	20.00
V.-C. C. Co.'s Kainit .....	....	....	12.00
Allison & Addison's Fulton Acid Phosphate..	14.00	....	....
Allison & Addison's I. X. L. Acid Phosphate..	13.00	....	....
Allison & Addison's Standard Acid Phosphate.	12.00	....	....
Allison & Addison's Rockets Acid Phosphate..	12.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Allison & Addison's McGavock's Special Potash Mixture .....	10.00	....	2.00
Allison & Addison's B. P. Potash Mixture ....	10.00	....	2.00
Allison & Addison's Star Brand Special Tobacco Manure .....	9.00	2.26	2.00
Allison & Addison's Star Brand Special H. G. ....	9.00	2.06	5.00
Allison & Addison's Star Brand Guano.....	9.00	1.65	1.00
Allison & Addison's Little Giant Grain and Grass Grower .....	9.00	1.00	2.00
Allison & Addison's Anchor Brand Tobacco Fertilizer .....	8.50	2.26	2.00
Allison & Addison's Star Brand Vegetable Guano .....	8.00	3.75	4.00
Allison & Addison's A. A. Guano.....	8.00	2.47	3.00
Allison & Addison's Anchor Brand Fertilizer. ....	8.00	1.65	2.00
Allison & Addison's Old Hickory Guano.....	8.00	1.65	2.00
Allison & Addison's Peanut Grower.....	8.00	1.00	4.00
Atlantic and Virginia Fertilizer Co.'s Eureka Acid Phosphate .....	16.00	....	....
Atlantic and Virginia Fertilizer Co.'s Valley of Virginia Phosphate .....	14.00	....	....
Atlantic and Virginia Fertilizer Co.'s Crenshaw Acid Phosphate .....	13.00	....	....
Atlantic and Virginia Fertilizer Co.'s Our Acid Phosphate .....	12.00	....	....
Atlantic and Virginia Fertilizer Co.'s Eureka Bone and Potash Compound.....	10.00	....	2.00
Atlantic and Virginia Fertilizer Co.'s Eureka Ammoniated Bone Special for Tobacco.....	9.00	2.06	2.00
Atlantic and Virginia Fertilizer Co.'s Orient Complete Manure .....	9.00	1.65	2.00
Atlantic and Virginia Fertilizer Co.'s Virginia Truckers .....	8.00	4.12	5.00
Atlantic and Virginia Fertilizer Co.'s Eureka Ammoniated Bone .....	8.00	1.65	2.00
Atlantic and Virginia Fertilizer Co.'s Orient Special for Tobacco .....	8.00	1.65	2.00
Atlantic and Virginia Fertilizer Co.'s Peanut Grower .....	8.00	1.00	4.00
Atlantic and Virginia Fertilizer Co.'s Carolina Trucker .....	7.00	5.76	7.00
Charlotte Oil and Fertilizer Co.'s 15 Per Cent Acid Phosphate .....	15.00	....	....
Charlotte Oil and Fertilizer Co.'s Catawba Acid Phosphate .....	14.00	....	....
Charlotte Oil and Fertilizer Co.'s Acid Phosphate .....	13.00	....	....
Charlotte Oil and Fertilizer Co.'s Dayvault's Special .....	12.00	....	6.00
Charlotte Oil and Fertilizer Co.'s Dissolved Bone .....	12.00	....	....
Charlotte Oil and Fertilizer Co.'s Oliver's Perfect Wheat Grower .....	11.00	2.47	4.00
Charlotte Oil and Fertilizer Co.'s 10-2 Bone and Potash .....	10.00	....	2.00
Charlotte Oil and Fertilizer Co.'s High Grade Special Tobacco Fertilizer .....	9.00	2.06	2.00
Charlotte Oil and Fertilizer Co.'s Queen of the Harvest C. S. M. ....	9.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Charlotte Oil and Fertilizer Co.'s McCrary's Diamond Bone and Potash.....	9.00	....	3.00
Charlotte Oil and Fertilizer Co.'s Groom's Special Tobacco Fertilizer .....	8.00	2.47	4.00
Charlotte Oil and Fertilizer Co.'s Catawba Guano B. G. ....	8.00	2.47	3.00
Charlotte Oil and Fertilizer Co.'s Special 3 Per Cent Guano C. S. M. ....	8.00	2.47	2.00
Charlotte Oil and Fertilizer Co.'s Ammoniated Guano B. G. ....	8.00	2.06	1.50
Charlotte Oil and Fertilizer Co.'s Ammoniated Guano C. S. M. ....	8.00	2.06	1.50
Charlotte Oil and Fertilizer Co.'s The Leader B. G. ....	8.00	1.65	2.00
Charlotte Oil and Fertilizer Co.'s King Cotton Grower .....	8.00	1.65	2.00
Davie & Whittle's Owl Brand High Grade Acid Phosphate .....	16.00	....	....
Davie & Whittle's Owl Brand High Grade Dissolved Bone .....	14.00	....	....
Davie & Whittle's Owl Brand Acid Phosphate.	13.00	....	....
Davie & Whittle's Owl Brand Dissolved Bone.	12.00	....	....
Davie & Whittle's Owl Brand Acid Phosphate with Potash .....	10.00	....	2.00
Davie & Whittle's Owl Brand High Grade 3 Per Cent Soluble Guano .....	9.00	2.06	3.00
Davie & Whittle's Owl Brand Special Tobacco Guano .....	9.00	2.06	2.00
Davie & Whittle's Owl Brand Truck Guano..	8.00	4.94	5.00
Davie & Whittle's Owl Brand Guano for To- bacco .....	8.00	2.47	3.00
Davie & Whittle's Vinco Guano.....	8.00	1.65	3.00
Davie & Whittle's Owl Brand Guano.....	8.00	1.65	2.00
Davie & Whittle's Peanut Grower .....	8.00	1.00	4.00
Durham Fertilizer Co.'s Best Acid Phosphate.	16.00	....	....
Durham Fertilizer Co.'s Standard High Grade Acid Phosphate .....	14.00	....	....
Durham Fertilizer Co.'s Excelsior Dissolved Bone .....	14.00	....	....
Durham Fertilizer Co.'s Blacksburg Dissolved Bone .....	13.00	....	....
Durham Fertilizer Co.'s N. C. Farmers' Alli- ance Official Acid Phosphate.....	13.00	....	....
Durham Fertilizer Co.'s Double Bone Phos- phate .....	13.00	....	....
Durham Fertilizer Co.'s Acid Phosphate.....	12.00	....	....
Durham Fertilizer Co.'s Great Wheat and Corn Grower .....	10.50	....	1.50
Durham Fertilizer Co.'s Diamond Wheat Mix- ture .....	10.00	....	3.00
Durham Fertilizer Co.'s Standard Wheat and Corn Grower .....	10.00	....	2.00
Durham Fertilizer Co.'s Blue Ridge Wheat Grower .....	10.00	....	2.00
Durham Fertilizer Co.'s Standard Wheat Grower .....	10.00	....	2.00
Durham Fertilizer Co.'s Bone and Potash Mix- ture .....	10.00	....	2.00
Durham Fertilizer Co.'s L. & M. Special.....	9.00	2.47	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Durham Fertilizer Co.'s Standard Guano....	9.00	1.65	2.00
Durham Fertilizer Co.'s Ammoniated Fertilizer .....	9.00	1.65	1.00
Durham Fertilizer Co.'s Special Plant and Truck Fertilizer .....	8.00	4.12	3.00
Durham Fertilizer Co.'s Durham High Grade.	8.00	3.29	4.00
Durham Fertilizer Co.'s Gold Medal Brand Guano .....	8.00	2.47	3.00
Durham Fertilizer Co.'s Yellow Leaf Tobacco Guano .....	8.00	2.47	3.00
Durham Fertilizer Co.'s N. C. Farmers' Alliance Official .....	8.00	2.06	3.00
Durham Fertilizer Co.'s Pride of Durham Tobacco Grower .....	8.00	2.06	3.00
Durham Fertilizer Co.'s Raw Bone Superphosphate for Tobacco .....	8.00	2.06	2.00
Durham Fertilizer Co.'s Raw Bone Superphosphate .....	8.00	2.06	1.50
Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano .....	8.00	1.65	2.00
Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano for Tobacco.....	8.00	1.65	2.00
Durham Fertilizer Co.'s Blacksburg Soluble Guano .....	8.00	1.65	2.00
Durham Fertilizer Co.'s Progressive Farmer Guano .....	8.00	1.65	2.00
Durham Fertilizer Co.'s Peanut Grower.....	8.00	1.00	4.00
Durham Fertilizer Co.'s Carr's Special Wheat Grower .....	8.00	....	4.00
Durham Fertilizer Co.'s Best Potato Manure.	7.00	5.76	7.00
Lynchburg Guano Co.'s Ironside Acid Phosphate .....	16.00	....	....
Lynchburg Guano Co.'s Lynchburg High Grade Acid Phosphate .....	14.00	....	....
Lynchburg Guano Co.'s Arvonja Acid Phosphate .....	13.00	....	....
Lynchburg Guano Co.'s Spartan Acid Phosphate .....	12.00	....	....
Lynchburg Guano Co.'s Alpine Mixture.....	10.00	....	5.00
Lynchburg Guano Co.'s S. W. Special Bone and Potash Mixture .....	10.00	....	4.00
Lynchburg Guano Co.'s Dissolved Bone and Potash .....	10.00	....	2.00
Lynchburg Guano Co.'s Independent Standard	8.50	1.65	2.00
Lynchburg Guano Co.'s Bright Belt Guano...	8.00	2.47	3.00
Lynchburg Guano Co.'s Solid Gold Tobacco Guano .....	8.00	2.26	4.00
Lynchburg Guano Co.'s New Era.....	8.00	1.65	3.00
Lynchburg Guano Co.'s Lynchburg Soluble...	8.00	1.65	2.00
Lynchburg Guano Co.'s Lynchburg Soluble for Tobacco .....	8.00	1.65	2.00
Norfolk and Carolina Chemical Co.'s Norfolk Reliable Acid Phosphate .....	14.00	....	....
Norfolk and Carolina Chemical Co.'s Norfolk Best Acid Phosphate .....	13.00	....	....
Norfolk and Carolina Chemical Co.'s Norfolk Soluble Bone .....	12.00	....	....
Norfolk and Carolina Chemical Co.'s Norfolk Bone and Potash .....	10.00	....	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Norfolk and Carolina Chemical Co.'s Norfolk Truck and Tomato Grower.....	8.00	4.12	5.00
Norfolk and Carolina Chemical Co.'s Amazon High Grade Manure .....	8.00	2.47	3.00
Norfolk and Carolina Chemical Co.'s Bright Leaf Tobacco Grower .....	8.00	2.47	3.00
Norfolk and Carolina Chemical Co.'s Amazon H. G. Special Tobacco Guano.....	8.00	2.47	3.00
Norfolk and Carolina Chemical Co.'s Cooper's Bright Tobacco Fertilizer .....	8.00	2.06	3.00
Norfolk and Carolina Chemical Co.'s Genuine Slaughter House Bone Guano, Made Expressly for Tobacco .....	8.00	2.06	2.00
Norfolk and Carolina Chemical Co.'s Crescent Brand Ammoniated Fertilizer .....	8.00	1.65	2.00
Norfolk and Carolina Chemical Co.'s Genuine Slaughter House Bone Guano.....	8.00	1.65	2.00
Norfolk and Carolina Chemical Co.'s Peanut Grower .....	8.00	1.00	4.00
Old Dominion Guano Co.'s High Grade Acid Phosphate .....	14.00	....	....
Old Dominion Guano Co.'s Bone Phosphate..	13.00	....	....
Old Dominion Guano Co.'s Royster's Acid Phosphate .....	12.00	....	....
Old Dominion Guano Co.'s Obelisk Brand Bone and Potash .....	10.00	....	4.00
Old Dominion Guano Co.'s Planter's Bone and Potash Mixture .....	10.00	....	3.00
Old Dominion Guano Co.'s Alkaline Bone and Potash .....	10.00	....	2.00
Old Dominion Guano Co.'s Horne's Cotton Fertilizer .....	9.00	2.06	3.00
Old Dominion Guano Co.'s Standard Raw Bone Soluble Guano .....	9.00	1.65	1.00
Old Dominion Guano Co.'s Farmers' Friend High Grade Fertilizer .....	8.00	2.47	3.00
Old Dominion Guano Co.'s Farmers' Soluble Bone High Grade Special Tobacco Manure.	8.00	2.47	3.00
Old Dominion Guano Co.'s Farmers' Friend Special Tobacco Fertilizer .....	8.00	2.47	3.00
Old Dominion Guano Co.'s Oseola Tobacco Guano .....	8.00	2.06	3.00
Old Dominion Guano Co.'s Farmers' Friend Fertilizer .....	8.00	1.65	2.00
Old Dominion Guano Co.'s Old Dominion Special Wheat Guano .....	8.00	1.65	2.00
Old Dominion Guano Co.'s Old Dominion Soluble Tobacco Guano .....	8.00	1.65	2.00
Old Dominion Guano Co.'s Bullock's Cotton Guano .....	8.00	1.65	2.00
Old Dominion Guano Co.'s Soluble Guano....	8.00	1.65	2.00
Old Dominion Guano Co.'s Peanut Grower...	8.00	1.00	4.00
Old Dominion Guano Co.'s Miller's Special Wheat Mixture .....	8.00	....	4.00
Old Dominion Guano Co.'s 7-7-7 Truck Guano.	7.00	5.76	7.00
Old Dominion Guano Co.'s Potato Manure...	7.00	4.12	8.00
Old Dominion Guano Co.'s 7 Per Cent Truck Fertilizer .....	6.00	5.76	6.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Old Dominion Guano Co.'s 6-7-5 Truck Guano.	6.00	5.76	5.00
Old Dominion Guano Co.'s Special Sweet Potato Guano .....	6.00	1.65	6.00
Old Dominion Guano Co.'s 10 Per Cent Truck Fertilizer .....	5.00	8.24	2.50
Powers, Gibbs & Co.'s Almont High Grade Acid Phosphate .....	14.00	....	....
Powers, Gibbs & Co.'s Fulp's Acid Phosphate.	13.00	....	....
Powers, Gibbs & Co.'s Cotton Brand Acid Phosphate .....	13.00	....	....
Powers, Gibbs & Co.'s Almont Acid Phosphate.	12.00	....	....
Powers, Gibbs & Co.'s Cotton Brand Acid Phosphate .....	12.00	....	....
Powers, Gibbs & Co.'s Almont Acid Phosphate and Potash .....	10.50	....	1.50
Powers, Gibbs & Co.'s Almont Wheat Mixture.	10.00	....	3.00
Powers, Gibbs & Co.'s Dissolved Bone and Potash .....	10.00	....	2.00
Powers, Gibbs & Co.'s Cotton-seed Meal Standard Guano .....	9.00	2.47	2.00
Powers, Gibbs & Co.'s Truck Farmers' Special Ammoniated Guano .....	8.00	3.20	5.00
Powers, Gibbs & Co.'s Cotton Brand Ammoniated Dissolved Bone .....	8.00	3.29	4.00
Powers, Gibbs & Co.'s Old Kentucky High Grade Tobacco Manure .....	8.00	2.47	3.00
Powers, Gibbs & Co.'s Cotton Belt Ammoniated Guano .....	8.00	2.47	2.00
Powers, Gibbs & Co.'s Carolina Golden Belt Ammoniated Guano for Tobacco.....	8.00	2.06	3.00
Powers, Gibbs & Co.'s Powers' Ammoniated Guano .....	8.00	2.06	2.00
Powers, Gibbs & Co.'s Gibbs' Ammoniated Guano .....	8.00	2.06	1.50
Powers, Gibbs & Co.'s Almont Soluble Ammoniated Guano .....	8.00	1.65	2.00
Powers, Gibbs & Co.'s Cotton-seed Meal Soluble Ammoniated Guano .....	8.00	1.65	2.00
Powers, Gibbs & Co.'s Eagle Island Ammoniated Guano .....	8.00	1.65	2.00
Powers, Gibbs & Co.'s Peanut Grower.....	8.00	1.00	4.00
Southern Chemical Co.'s Comet 16 Per Cent Acid Phosphate .....	16.00	....	....
Southern Chemical Co.'s Click's 16 Per Cent Acid Phosphate .....	16.00	....	....
Southern Chemical Co.'s Red Cross 14 Per Cent Acid Phosphate .....	14.00	....	....
Southern Chemical Co.'s Victor Acid Phosphate .....	13.00	....	....
Southern Chemical Co.'s Chatham Acid Phosphate .....	13.00	....	....
Southern Chemical Co.'s Reaper Grain Application .....	12.00	....	3.00
Southern Chemical Co.'s Tar Heel Acid Phosphate .....	12.00	....	....
Southern Chemical Co.'s Horseshoe Acid Phosphate .....	12.00	....	....
Southern Chemical Co.'s Solid South.....	10.00	....	6.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Southern Chemical Co.'s Quickstep Bone and Potash .....	11.00	....	5.00
Southern Chemical Co.'s Winner Grain Mixture .....	10.00	....	4.00
Southern Chemical Co.'s Farmers' Pride Bone and Potash .....	10.00	....	3.00
Southern Chemical Co.'s Winston Bone and Potash .....	10.00	....	2.00
Southern Chemical Co.'s Mammoth Corn Grower .....	10.00	....	2.00
Southern Chemical Co.'s Mammoth Wheat and Grass Grower .....	10.00	....	2.00
Southern Chemical Co.'s Sun Brand Guano..	9.00	2.06	5.00
Southern Chemical Co.'s George Washington Plant Bed Fertilizer for Tobacco.....	8.00	2.47	2.50
Southern Chemical Co.'s Pilot Ammoniated Guano Special for Tobacco.....	8.00	2.06	3.00
Southern Chemical Co.'s Electric Tobacco Guano .....	8.00	1.65	2.00
Southern Chemical Co.'s Electric Standard Guano .....	8.00	1.65	2.00
Southern Chemical Co.'s Yadkin Complete Fertilizer .....	8.00	1.65	2.00
Southern Chemical Co.'s Click's Special Wheat Compound .....	8.00	....	4.00
J. G. Tinsley & Co.'s Powhatan Acid Phosphate .....	14.00	....	....
J. G. Tinsley & Co.'s Dissolved S. C. Bone....	13.00	....	....
J. G. Tinsley & Co.'s Stonewall Brand Acid Phosphate .....	12.00	....	....
J. G. Tinsley & Co.'s Bone and Potash Mixture	10.00	....	2.00
J. G. Tinsley & Co.'s Powhatan Tobacco Fertilizer .....	9.00	2.47	3.00
J. G. Tinsley & Co.'s Tobacco Fertilizer.....	8.00	3.29	2.50
J. G. Tinsley & Co.'s Richmond Brand Guano.	8.00	2.47	3.00
J. G. Tinsley & Co.'s Peruvian H. G. Tobacco Guano .....	8.00	2.47	3.00
J. G. Tinsley & Co.'s Killickinick Tobacco Mixture .....	8.00	2.06	3.00
J. G. Tinsley & Co.'s Appomattox Standard Tobacco Grower .....	8.00	1.65	2.00
J. G. Tinsley & Co.'s Lee Brand Guano.....	8.00	1.65	2.00
J. G. Tinsley & Co.'s Stonewall Tobacco Guano .....	8.00	1.65	2.00
J. G. Tinsley & Co.'s Peanut Grower.....	8.00	1.00	4.00
J. G. Tinsley & Co.'s Special Irish Potato Guano .....	6.00	5.76	6.00
J. G. Tinsley & Co.'s 7 Per Cent Ammoniated Guano for Truck .....	6.00	5.76	6.00
J. G. Tinsley & Co.'s Irish Potato Guano....	6.00	4.94	6.00
J. G. Tinsley & Co.'s Strawberry Grower.....	6.00	3.29	4.00
J. G. Tinsley & Co.'s Top Dresser.....	5.00	9.06	....
J. G. Tinsley & Co.'s 10 Per Cent Truck Guano	5.00	8.24	2.50
S. W. Travers & Co.'s Champion Acid Phosphate .....	16.00	....	....
S. W. Travers & Co.'s Dissolved Bone Phosphate .....	14.00	....	....
S. W. Travers & Co.'s Standard Dissolved S. C. Bone .....	13.00	....	....

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
S. W. Travers & Co.'s Capital Dissolved Bone.	12.00	....	....
S. W. Travers & Co.'s Capital Bone and Potash Compound .....	10.00	....	2.00
S. W. Travers & Co.'s National Tobacco Fertilizer .....	8.50	1.85	2.25
S. W. Travers & Co.'s Capital Truck Fertilizer .....	8.00	3.29	3.00
S. W. Travers & Co.'s Capital Tobacco Fertilizer .....	8.00	3.29	3.00
S. W. Travers & Co.'s Big Leaf Tobacco Grower .....	8.00	2.47	3.00
S. W. Travers & Co.'s Capital Cotton Fertilizer .....	8.00	2.06	2.00
S. W. Travers & Co.'s National Fertilizer....	8.00	1.65	2.00
S. W. Travers & Co.'s National Special Tobacco Fertilizer .....	8.00	1.65	2.00
S. W. Travers & Co.'s Beef Blood and Bone Fertilizer .....	8.00	1.65	2.00
S. W. Travers & Co.'s Peanut Grower.....	8.00	1.00	4.00
S. W. Travers & Co.'s Special Wheat Compound .....	8.00	....	4.00
S. W. Travers & Co.'s 7 Per Cent Truck Fertilizer .....	6.00	5.76	5.00
Virginia State Fertilizer Co.'s Bull Run Acid Phosphate .....	16.00	....	....
Virginia State Fertilizer Co.'s Gilt Edge Brand Acid Phosphate .....	14.00	....	....
Virginia State Fertilizer Co.'s Clipper Brand Acid Phosphate .....	13.00	....	....
Virginia State Fertilizer Co.'s Lurich Acid Phosphate .....	12.00	....	....
Virginia State Fertilizer Co.'s Alps Brand Acid Phosphate .....	12.00	....	....
Virginia State Fertilizer Co.'s Mountain Top Bone and Potash .....	10.00	....	5.00
Virginia State Fertilizer Co.'s XX Potash Mixture .....	10.00	....	4.00
Virginia State Fertilizer Co.'s Dissolved Bone and Potash .....	10.00	....	2.00
Virginia State Fertilizer Co.'s Number One Soluble Guano .....	9.00	1.65	2.00
Virginia State Fertilizer Co.'s Highland King.	9.00	1.65	1.00
Virginia State Fertilizer Co.'s Gamecock Special for Tobacco .....	8.50	1.65	2.00
Virginia State Fertilizer Co.'s High Grade Tobacco Guano .....	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Bull Dog Soluble Guano .....	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Dunnington's Special Formula for Tobacco.....	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Peerless Special Tobacco Guano .....	8.00	2.47	3.00
Virginia State Fertilizer Co.'s Buffalo Guano.	8.00	2.06	3.00
Virginia State Fertilizer Co.'s Austrian Tobacco Grower .....	8.00	2.06	2.00
Virginia State Fertilizer Co.'s Gilt Edge Special Tobacco Guano .....	8.00	2.06	2.00
Virginia State Fertilizer Co.'s Battle Ax Tobacco Guano .....	8.00	1.65	2.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Virginia State Fertilizer Co.'s Virginia State Guano .....	8.00	1.65	2.00
Virginia State Fertilizer Co.'s Gilt Edge Brand Dissolved Bone and Potash.....	8.00	....	4.00
<i>Wilson Chemical Co., Wilson, N. C.—</i>			
16 Per Cent Acid Phosphate.....	16.00	....	....
14 Per Cent Acid Phosphate.....	14.00	....	....
Bone and Potash Mixture No. 3.....	10.00	....	5.00
Bone and Potash Mixture No. 2.....	10.00	....	4.00
Bone and Potash Mixture No. 1.....	10.00	....	2.00
8-450-7 for Tobacco .....	8.00	3.70	7.00
Wilson Chemical Co.'s Gold Medal Cotton Grower .....	8.00	3.30	4.00
Wilson Chemical Co.'s Gold Medal Tobacco Grower .....	8.00	3.30	4.00
Planters Formula No. 1.....	8.00	2.47	10.00
Planters Formula No. 2.....	8.00	2.47	7.00
W. C. Co.'s Gilt Edge Tobacco Grower.....	8.00	2.47	5.00
East Carolina Cotton Grower.....	8.00	2.47	3.00
East Carolina Tobacco Grower .....	8.00	2.47	3.00
Cotton States Standard .....	8.00	1.65	2.00
Nitrate of Soda .....	....	14.00	....
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	50.00
H. G. 16 Per Cent Kainit.....	....	....	16.00
Genuine German Kainit .....	....	....	12.00
<i>Winborne Guano Co., Norfolk, Va.—</i>			
High Grade Acid Phosphate .....	16.00	....	....
Standard Acid Phosphate .....	14.00	....	....
Best Bone and Potash.....	11.00	....	4.00
Soluble Bone and Potash .....	10.00	....	2.00
Winborne's Triumph Guano .....	8.00	3.30	4.00
Winborne's King Guano .....	8.00	2.47	3.00
Winborne's Special Tobacco Guano .....	8.00	2.47	3.00
Winborne's Crop Grower .....	8.00	1.65	2.00
Winborne's Excelsior Guano .....	8.00	1.65	2.00
Florodora Eureka Guano .....	8.00	1.65	2.00
Climax Peanut Guano .....	8.00	.82	4.00
Premium Top Dresser .....	6.00	7.40	3.00
Special 5-6-7 Truck Guano .....	6.00	4.10	7.00
Winborne's Tip Top Tobacco Guano.....	6.00	3.30	5.00
Winborne's Sweet Potato Guano .....	6.00	2.47	6.00
Big Crop 7 Per Cent Guano.....	5.00	5.75	5.00
Nitrate of Soda .....	....	15.00	....
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00
<i>T. W. Wood &amp; Sons, Richmond, Va.—</i>			
Wood's Pure Animal Bone Meal.....Total	25.00	2.47	....
Ground Basic Slag .....	17.00	....	....
Standard H. G. Acid Phosphate .....	16.00	....	....
Standard High Grade Acid Phosphate.....	14.00	....	....
Standard Bone and Potash Mixture.....	10.00	....	2.00
Standard Corn Fertilizer .....	9.00	1.23	1.00

Name and Address of Manufacturer and Name of Brand.	Avail. Phos. Acid.	Nitrogen.	Potash.
Standard Wheat Fertilizer .....	9.00	1.23	1.00
Standard High Grade Truck Fertilizer.....	8.00	4.93	6.00
Standard Market Grower Fertilizer.....	8.00	3.29	4.00
Standard Irish Potato Fertilizer .....	8.00	2.47	10.00
Standard Vegetable Fertilizer .....	8.00	2.47	3.00
Standard Potato Fertilizer .....	8.00	1.65	5.00
Standard Grain and Grass Fertilizer.....	8.00	1.65	2.00
Standard Crop Grower Fertilizer.....	8.00	1.03	2.00
Wood's Lawn Enricher .....	6.00	2.47	3.00
Nitrate of Soda .....	....	15.63	....
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
Kainit .....	....	....	12.00

*The J. R. Young Fertilizer Co., Norfolk, Va.—*

J. R. Young's 3-8-3 Guano for Cotton.....	8.00	2.47	3.00
J. R. Young's New Process 2-8-2 Guano for Tobacco .....	8.00	2.47	3.00
J. R. Young's New Process 2-8-2 Guano for Cotton, Corn and Peanuts .....	8.00	1.65	2.00



### LEAF TOBACCO SALES FOR MARCH, 1914.

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Pounds sold for producers, first hand.....	3,619,001
Pounds sold for dealers.....	493,814
Pounds resold for warehouses.....	537,465
Total.....	<u>4,650,280</u>

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### LEAF TOBACCO SALES FOR APRIL, 1914.

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Pounds sold for producers, first hand.....	1,420,441
Pounds sold for dealers.....	142,127
Pounds resold for warehouses.....	190,795
Total.....	<u>1,753,363</u>



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**RALEIGH**

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**Hog Cholera and Its Prevention by the Use of  
Anti-Hog Cholera Serum**

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‡In cooperation with Bureau of Plant Industry, United States Department of Agriculture.

## LETTER OF TRANSMITTAL.

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RALEIGH, N. C.

HON. W. A. GRAHAM, *Commission of Agriculture.*

SIR:—I beg to submit herewith manuscript on Hog Cholera and its prevention by the use of anti-hog cholera serum. I recommend that this manuscript be published as the July BULLETIN.

B. B. FLOWE,  
*State Veterinarian.*

Approved for publication.

W. A. GRAHAM,  
*Commissioner of Agriculture.*

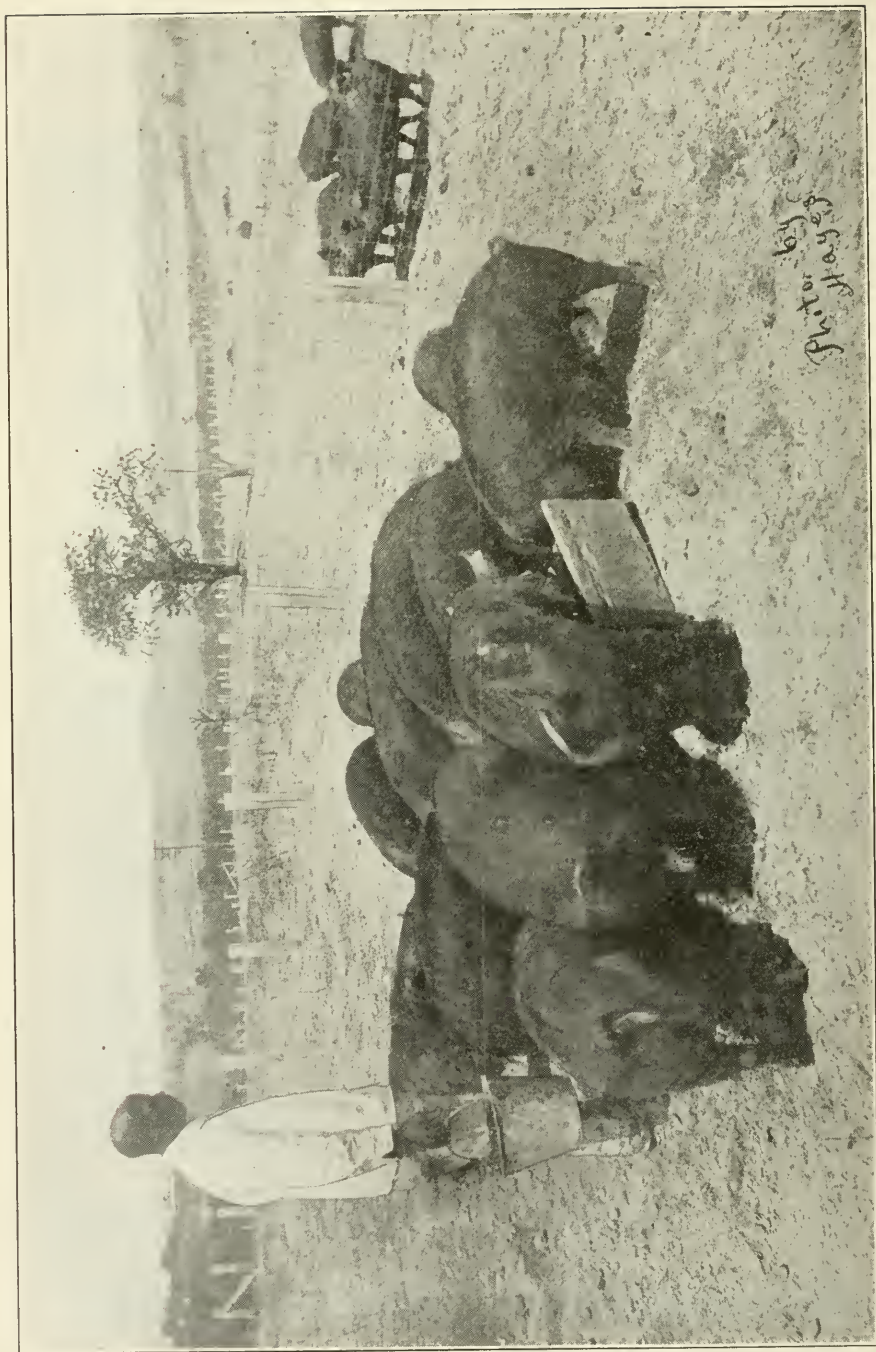


FIGURE 1.—Group of pure bred Berkshires (immuned).

# HOG CHOLERA

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BY B. B. FLOWE, STATE VETERINARIAN.

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Hog cholera is a highly contagious and infectious disease of hogs. It is characterized by high fever, ranging from 104 to 107 degrees Fahrenheit, loss of appetite, red or purple spots on the belly between the fore-legs and on the ears, and a muco-purulent discharge from the nose and eyes. This discharge often pastes the eyelids together, and causes a snuffling sound in breathing. In the last stage of the disease, and just before death, the animal has muscular tremors and wobbling gait.

## PERIOD OF INCUBATION.

The period of incubation is the number of days between contracting the germ causing hog cholera, and the manifestation of the first symptoms or evidence of sickness. This time ranges from four to twenty-one days, depending on the susceptibility of the individual hog and the virulence of the infection.

An acute form of hog cholera indicates a virulent form of infection, while a slow or chronic form of hog cholera indicates an infection weak in virulency.

## SYMPTOMS.

A post-mortem and anti-mortem study of hog cholera will show a greater variety of symptoms than any other disease affecting hogs. For this reason, it is often hard for the farmer who has not had special training along this line to detect the first sick hog in his herd, and often a large per cent of his hogs are sick before he even suspects they are sick. Then not being able to detect the nature of the disease he does nothing until most of his hogs are sick and the first ones to show any signs of being sick are beginning to die, when it is too late to do anything. So far, we know nothing that will cure an advanced case of hog cholera. Then, again, we see in some herds one or two hogs that contract a mild form of the disease and are off feed for a few days, but soon recover. From these animals the entire herd may become infected, and this before cholera is even suspected.

In the chronic form we are more apt to be deceived, and this is especially so when there has been a previous outbreak of an acute form on the farm. This is so because in the chronic form the affected hogs will linger along for weeks and sometimes for more than a month before they finally die, or recover, as the case may be. But the acute form usually wipes the entire herd out within a short time after it first gains entrance in the herd.

Among the first symptoms seen in hogs affected with cholera is a loss of appetite, a tendency to hide in the litter or some secluded place and if forced to get up they show a stiffness in their gait, as if they had tender feet, and the back is usually more or less arched. At first there

is a tendency towards constipation which is followed in a few days by a very fetid diarrhea. In light skin hogs, and at times in dark skin hogs, a red or purple discoloration of the skin can be detected along the belly between the fore legs and at the base of the ears. This symptom is not always present but is frequently seen. When cholera is suspected, it is well to secure a clinical thermometer and take the temperature of a number of those hogs that are eating and apparently well.

We frequently find in a herd where there has been one or more sick hogs for several days a number of the hogs apparently well showing a temperature as high as 104 to 107 degrees Fahrenheit, and even higher. Hogs affected with cholera will often carry these high temperatures from three to five days and appear to be entirely healthy, but are ready to come down with an acute form of cholera. The normal temperature of a hog is from 101 to 102 degrees Fahrenheit.

Owing to the high temperature, lack of appetite and general depression, vomiting, thumps, quick or jerky breathing is frequent. The muco-purulent secretion from the eyes often becomes so heavy that the eyelids are adhered together causing the hog to become blind.

The most striking difference between the acute and chronic form of cholera is the duration of the disease. In the chronic form the temperature is not so high. The hog may continue to eat a little every day but becomes unthrifty and emaciated and may linger along in this condition for three or four weeks before dying. The acute form usually terminates in death between the eighth and fourteenth day.

When there is any doubt of the sick hogs being affected with cholera, a post-mortem examination should be made on one of the sick hogs in order to make an accurate diagnosis.

#### POST-MORTEM APPEARANCES.

*Skin.*—A close examination of the skin will show red or purple spots along the belly, between the fore and hind legs and at the base of the ears; this is especially so in light skin hogs. In chronic cases the skin may become dry and hard and slough out in places. The ears and tail may also slough off.

*Stomach.*—The mucous membrane or inner lining of the stomach may be very much inflamed and red, frequently showing evidence of ulcers.

*Lymphatic Glands.*—Enlarged, congested, showing hemorrhagic spots when cut open. Of these glands receiving special attention in hog cholera are the mesenteric glands, or those along the intestines; lumbar and retroperitoneal are those lying near the back wall of the abdominal cavity; the lymphatic glands found near the angle of the jaw; the mediastinal and bronchial glands in the region of the heart and lungs, and the inguinal glands found beneath the skin high upon the inside of the thigh.

*Intestines.*—The inner lining, or the mucous membrane of the intestines, especially near the ilco-cecal valve, the place where the small intestine opens into the large intestine, may be congested and covered with small red spots. At this point in the intestine it is not uncommon to see ulcers varying in size and shape. One of the most constant is the somewhat circular button-shaped ulcer standing out from the surround-

ing mucous membrane, with a greenish-yellow center. The outer surface of the large and small intestines may be literally covered with bloody spots. Small greenish-yellow ulcers may be seen on the outer surface of both small and large intestines.

*Spleen.*—Almost without exception, the spleen or "milt" is enlarged, dark and soft and covered with small red spots and easily ruptured.

*Kidneys.*—When the capsule, or covering of the kidney is removed, dark red spots are seen. Frequently these hemorrhagic spots are so numerous that it reminds one of the speckling of a turkey's egg. Congestion and hemorrhagic spots are also detected when the kidney is cut open.

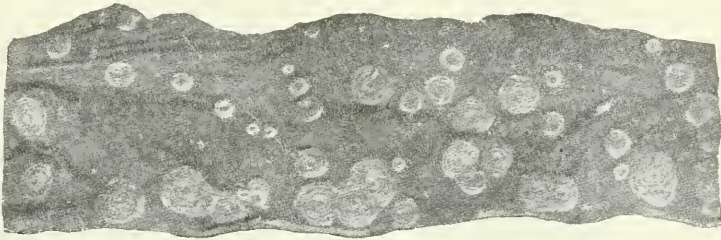


FIGURE 2.—Ulcers (large intestine), chronic form.

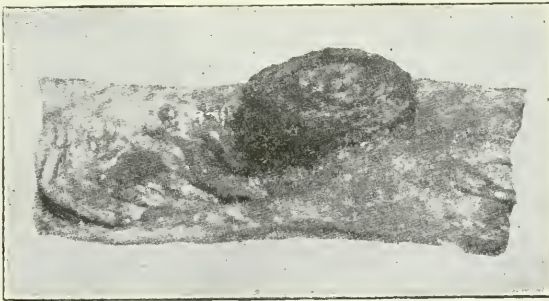


FIGURE 3.—"Button ulcers" (large intestine), chronic form.

*Bladder.*—The inner lining of the bladder may be found congested with numerous hemorrhagic spots on the surface.

*Heart.*—Numerous petechiæ and hemorrhagic spots may be found on the heart.

*Lungs.*—In well defined cases of cholera small red or hemorrhagic spots may be found on the lungs. Again large, dark, consolidated spots are found, due to congestion and collapse of the lung tissue. In the chronic form pus may be found in the lungs. Sometimes the lungs are adhered to the chest walls and diaphragm.

#### SYMPTOMS USUALLY FOUND IN WELL DEFINED CASES OF HOG CHOLERA.

*Anti-Mortem.*—Lack of appetite, unthrifty, high temperature, emaciation, arched back, wobbling gait, red or purple skin along the belly be-

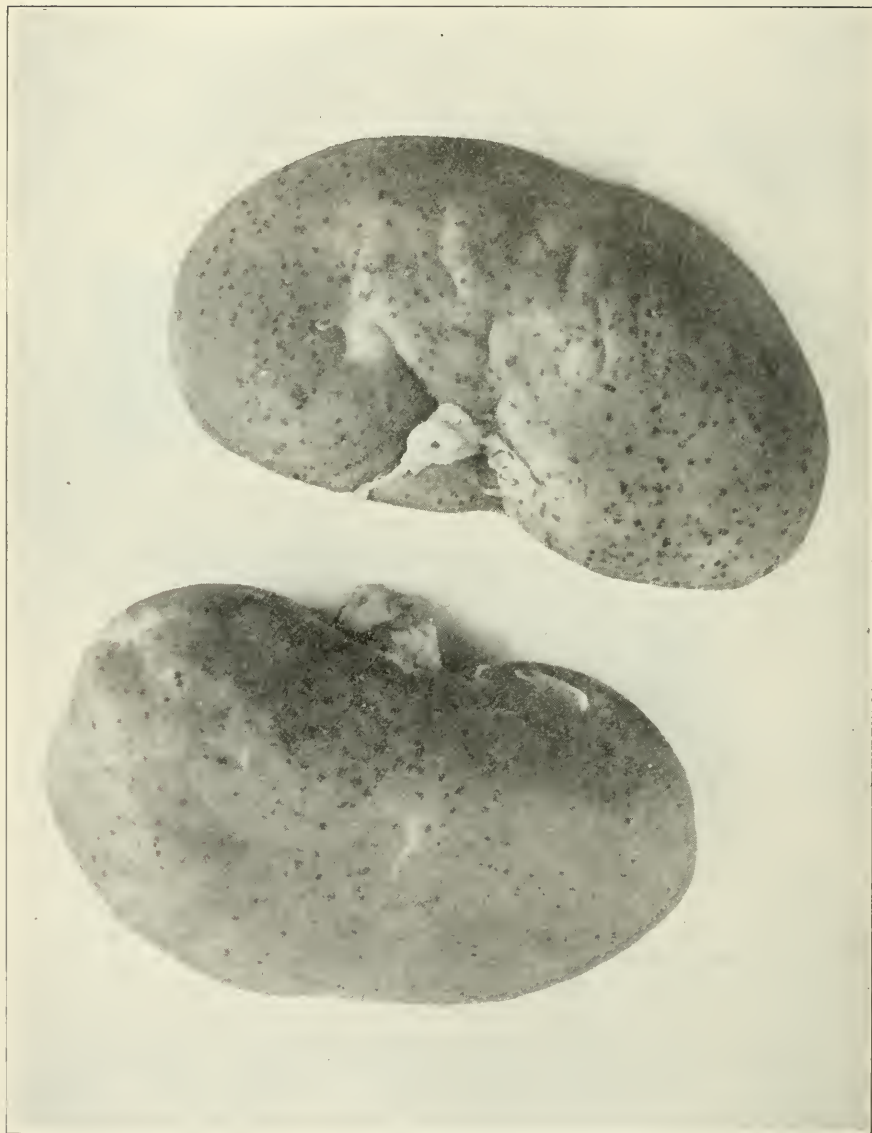


FIGURE 4.—Kidney, showing typical lesions of hog cholera (hemorrhagic spots).

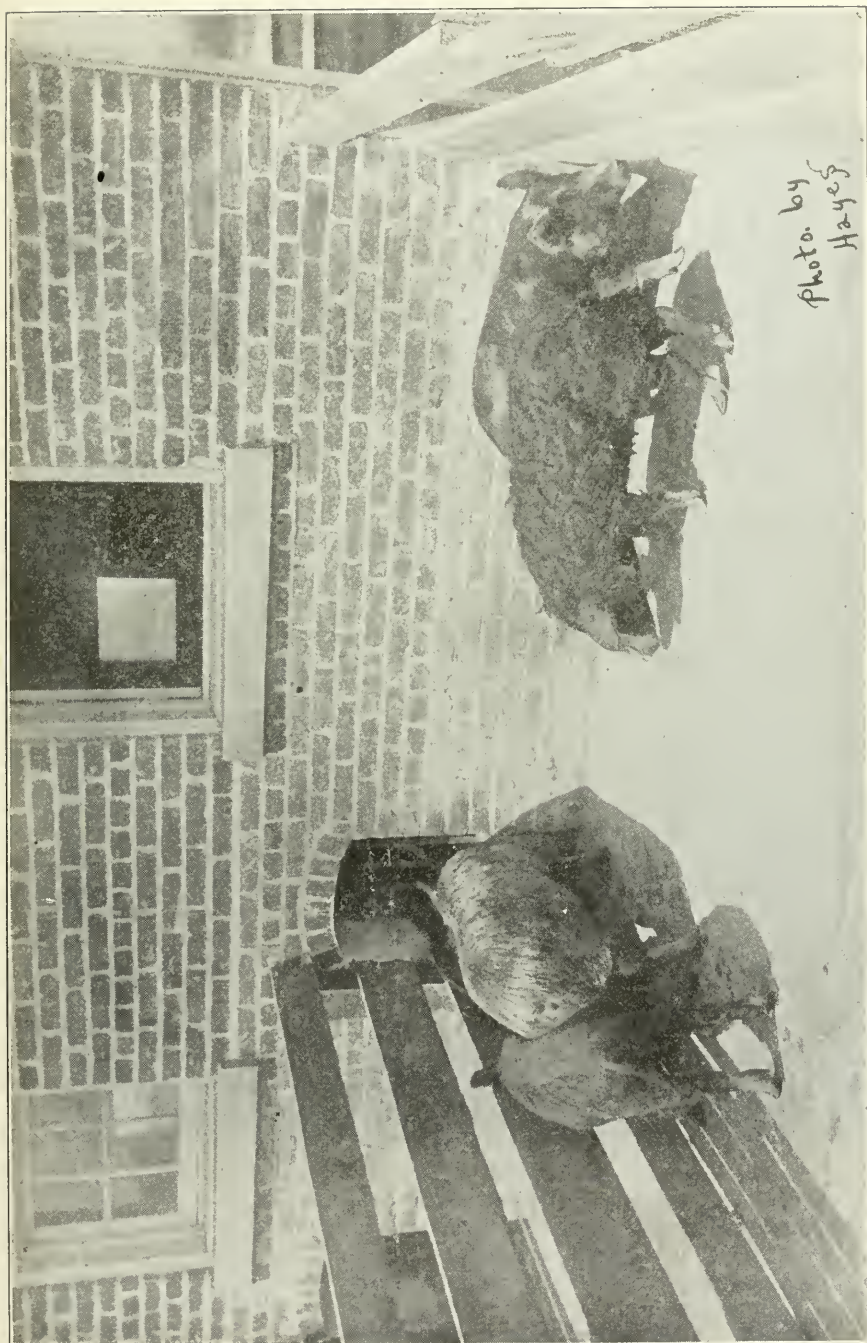


FIGURE 5.—Hogs affected with cholera.

tween front and hind legs and base of ears, and constipation followed by diarrhea.

*Post-Mortem*.—Hemorrhagic spots on kidney, lung, intestinal lesions and congestion of lymphatic glands. Congested spleen studded with petechiæ spots.

#### INFECTED PREMISES.

The length of time before it is safe to put non-immune hogs on infected premises will depend largely upon the character of the grounds infected. If the grounds are well drained and are not covered with too much litter, so that the rays of the sun will reach all parts of the ground, it would probably be safe to add susceptible hogs to the premises in three months. But, if the grounds are not well drained and have low, wet or marshy places, it would not be safe to add susceptible hogs to the grounds under twelve months, or even longer. When conditions will permit every effort possible should be made to thoroughly disinfect the infected premises before hogs that are susceptible to cholera are added to the premises.

#### SANITATION.

Under the ordinary farm conditions, it is practically impossible to disinfect thorough enough to kill out all of the hog cholera infection, but where possible all litter should be raked up and burned. This can be done in small lots and should be followed with a spray of a five per cent solution of carbolic acid, lysol, creolin or any other reliable disinfectant, and a liberal application of lime. The pens and houses can be disinfected in a like manner; if they are inexpensive, ones it would be better to tear them down and burn them. All mud holes and cesspools should be drained and filled up.

If these measures are followed one would most likely be safe in adding susceptible hogs to the premises. If the hog lots or pastures can be used for any other purpose and new quarters can be found for the hogs, it would be much safer.

Susceptible hogs should be treated with anti-hog cholera serum if they are to be placed on the infected grounds under twelve months. Since it is practically impossible to thoroughly disinfect a large premise, the hogs should be immuned to cholera before they are allowed access to the infected grounds, but bear in mind it is always well to use disinfectants liberally around hog houses.

When cholera has broken out in a herd of hogs in a field, this field should be covered with a heavy application of lime, and a crop grown on it for one year before it is used again, unless the hogs are "immune."

#### SOME OF THE WAYS BY WHICH HOG CHOLERA IS SPREAD.

It is well to bear in mind that every case of hog cholera comes from a previous case of cholera. It is impossible to produce a case of cholera without having the germs that cause hog cholera. No matter how filthy the lots or pens in which the hogs are kept, they cannot have cholera unless the germs from a previous case of cholera are introduced. The disease cannot arise spontaneously. All secretions and excretions are laden with the infection and if allowed to enter into a susceptible hog's system will produce cholera.



(From group in State Museum—mounted by T. W. Adickes.)

FIGURE 6.—Buzzards feeding on cholera carcass.

Since hog cholera must come from some previous case of cholera, it behooves us to see that the carcasses of all hogs dying from cholera are properly disposed of. The infected lots and pens should be held under strict quarantine. All cholera carcasses should be burned or buried deep and covered with lime. Cholera may be carried from an infected premise by dogs, cats, rabbits, crows, pigeons, buzzards or any other animal that moves from one place to another.

#### THE TURKEY BUZZARD.

The turkey buzzard is one of the three worst agents by which hog cholera is disseminated in this State. The other two are free range, and running streams and overflows. Whenever the carcass of an animal is left on top of the ground, no matter what was the cause of death, the buzzards are certain to be attracted to the carcass. If the carcass is one of a cholera hog they feed upon it and fly away to some other farm, at times many miles away and they are certain to carry the hog cholera germs with them. If these germs are deposited in reach of other hogs they are certain to cause an outbreak of cholera. The importance of burying all carcasses, especially all cholera carcasses and carcasses of other infectious diseases, cannot be emphasized too much.\*

There is a general impression among all farmers that the buzzards are protected by law. This seems to be an erroneous idea. After a considerable search of the statute, we have been unable to find any law that would protect the buzzard. Since there is no question but what the buzzard disseminates disease germs, especially hog cholera germs, every farmer would be justifiable in killing all the buzzards he possibly can.

#### RUNNING STREAMS AND OVERFLOWS.

The infection can be carried for miles down a running stream. If infected hogs are allowed access to the stream of water running through the farm, the stream then becomes a source of disseminating the infection over a wide area. So it is not safe to allow hogs to have access to running streams that do not have their origin on the farm.

The overflows in the Eastern part of this State are a source of disseminating the infection over a wide area. Especially is this so where the dead hogs are not properly disposed of, or where the hogs die in the swamps and no attempt is made to locate and bury them.

Often hogs in the free-range territory die from cholera in a running stream or in large swamps and are never seen by their owners. These hogs serve as centers from which infection is scattered broadcast during overflows.

#### PUBLIC ROADS.

The public roads are another source of disseminating the infection. Sick hogs often have access to the public roads and leave them infected. It then becomes dangerous to drive well hogs on the public highway.

#### SHOW HOGS.

Often hogs contract cholera at shows and when brought back to the farm, and turned in the lots with the other hogs, become the agent by

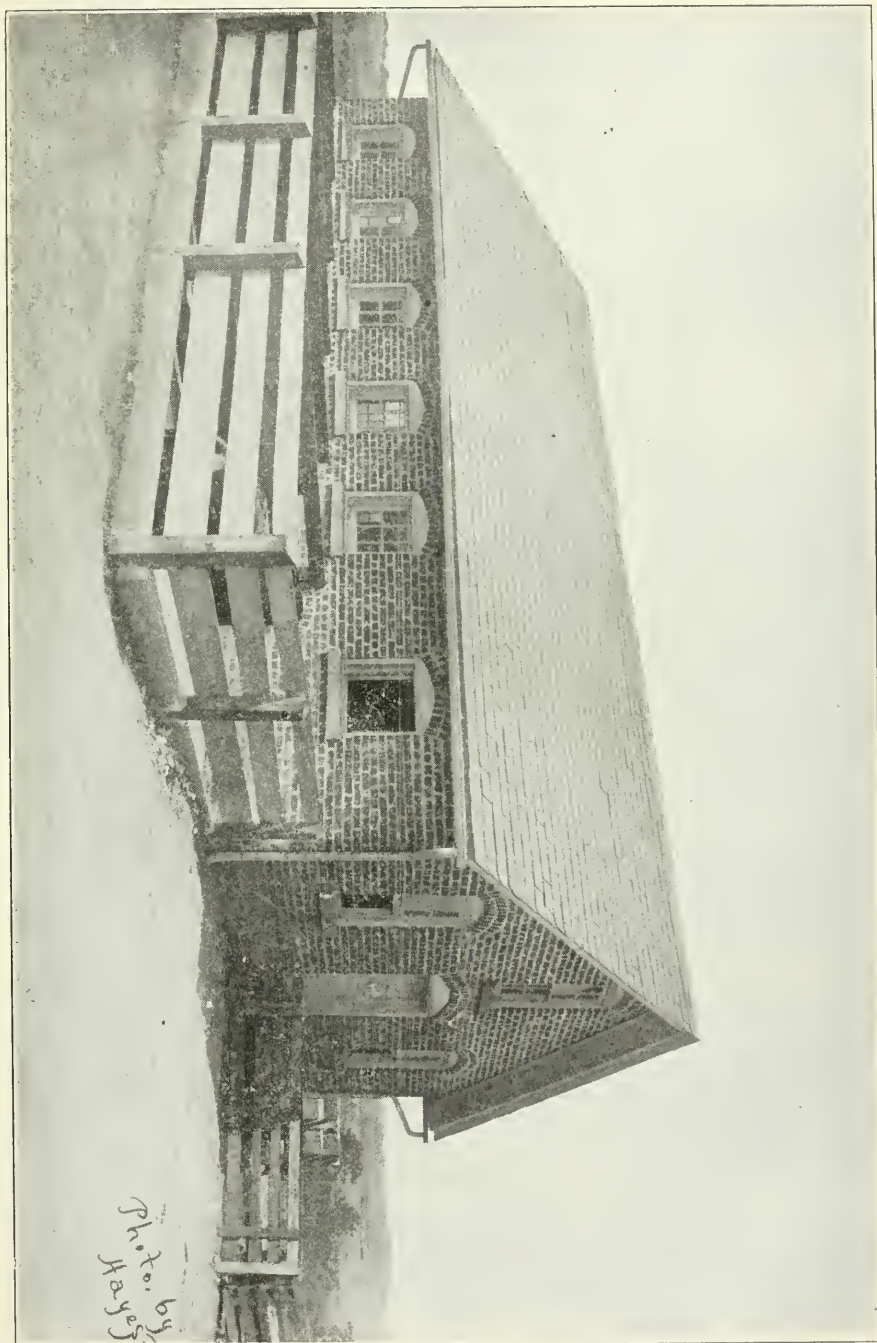


FIGURE 7.—Hog house.

which the entire herd is infected. All hogs coming from the shows or new hogs being added to the herd should be held under quarantine at least three weeks before they are allowed to run with the other hogs.

#### PUBLIC STOCK YARDS.

All public stock yards are infected with hog cholera germs. It is unsafe to purchase hogs from stock yards for breeding or feeding purposes. Nor should hogs intended for breeding or feeding purposes be unloaded in pens to be fed unless these pens are thoroughly disinfected. The cars in which the hogs are shipped should be thoroughly disinfected before the hogs are loaded. All hogs unloaded in public stock yards, not intended for immediate slaughter, should be treated with anti-hog cholera serum.

#### INFECTED HOGS RUNNING AT LARGE.

In the territory where live stock run at large, we find a larger per cent of hog cholera. This is due to hogs affected with cholera coming in contact with hogs from adjoining farms. In this way the infection is often spread from farm to farm.

*Visitors.*—Hog cholera infection can be carried on the shoes and clothes of people. It is unsafe for any one to visit an infected herd and return to their own or any other herd of hogs.

*Garbage.*—Uncooked garbage from hotels, restaurants or other sources is dangerous. We know of no instance in this State where uncooked garbage has been fed for any length of time where cholera did not develop. Feed it only to immuned hogs or have it thoroughly cooked.

#### THE ANNUAL LOSS IN THE UNITED STATES FROM HOG CHOLERA.

The annual loss of hogs in the United States from hog cholera is estimated at the enormous sum of sixty million (\$60,000,000) dollars. If this enormous loss of a preventable disease was checked it would go a long way in reducing the high cost of pork.

#### THE ANNUAL LOSS IN NORTH CAROLINA.

According to the best information we have the annual loss from hog cholera in North Carolina, both direct and indirect, is considerably over three quarters of a million dollars (\$750,000). This enormous loss is going on while many thousands of dollars are being sent out of the State annually for pork, lard and other meat products.

#### SUSCEPTIBILITY.

Young pigs and young shoats are more susceptible than older hogs, but often we find the older hogs the first to succumb to the disease.

As to the susceptibility of the different breeds, we do not believe there is any difference. The "scrub" hog and "mule-footed hog" succumb to the disease as readily as the pure breeds.



FIGURE 8.—Interior of hog house, showing concrete pens.

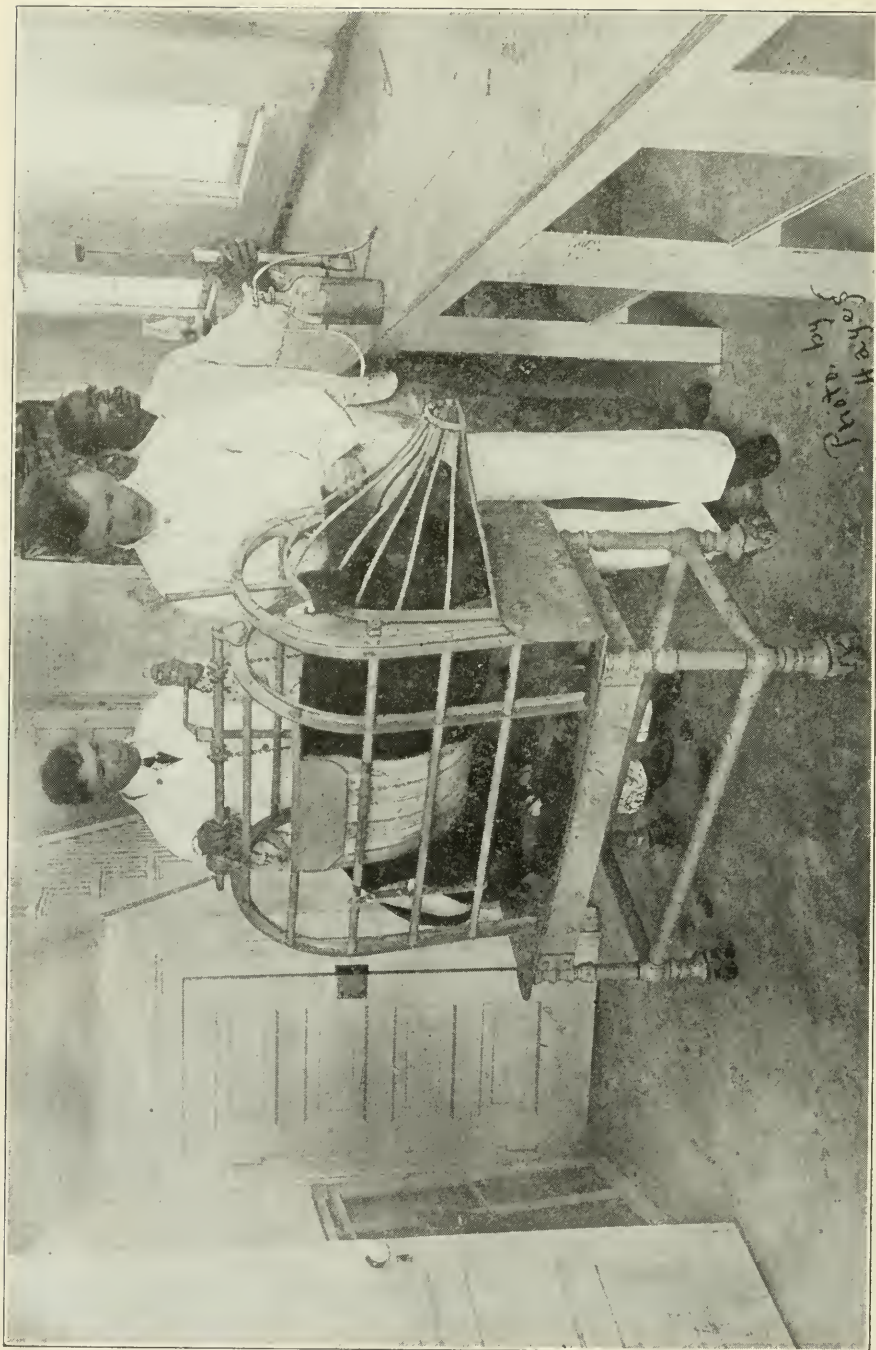


FIGURE 9.—Hyperimmunizing (left ear).

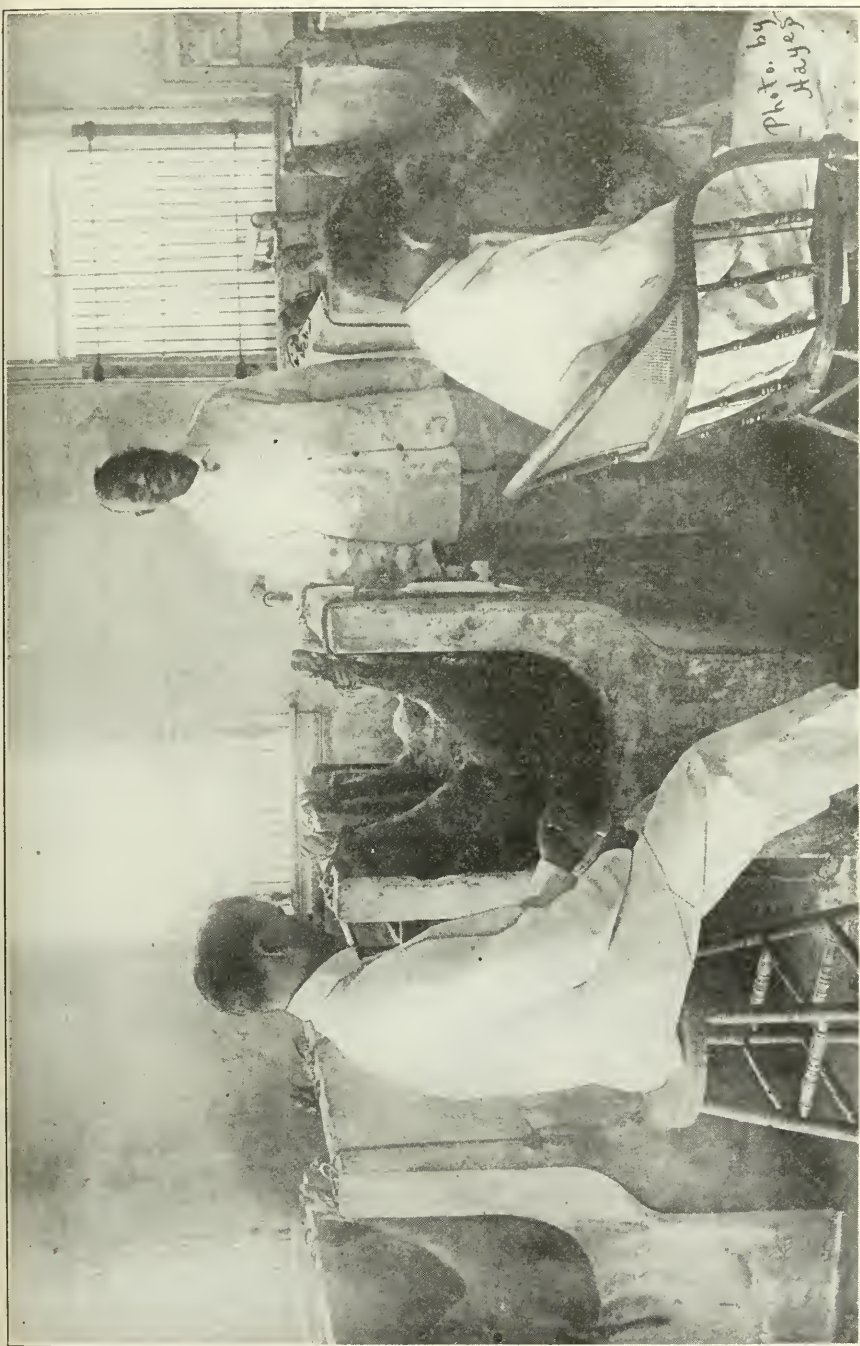


FIGURE 10.—Hyperimmunes being bled by tail.

## MORTALITY.

The mortality will vary in different localities and on different farms. When cholera first makes its appearance in a locality the per cent of deaths, as a rule, is higher than it is at the end of the outbreak. The same is also true in communities where cholera has appeared for a number of years in succession. The per cent of losses will range around fifty per cent in some localities; in other as high as ninety-five per cent. This depends on the virulency of infection and the susceptibility of the hogs.

As a rule hogs recovering from cholera are greatly depreciated in value. Unless the hogs are exceptionally valuable ones, it would be more economical to destroy and burn them when they have developed a well defined case of cholera.

## ANTI-HOG CHOLERA SERUM.

In order to make potent anti-hog cholera serum, it is necessary to select a hog that is "immune" to cholera. This hog is one that has been treated with serum and virus at least twenty-one days, or one that has recovered from an attack of cholera. One attack of cholera confers life immunity. Into this "immune" hog ten cubic centimeters of virus are injected direct or indirect into the circulation for every pound of live weight. This hog is then known as a hyper-immune.

In the course of eight to ten days the hyper-immune is bled by the tail, taking as much blood as the hog will stand. As soon as the hog recovers from the effect of having a large quantity of blood removed from it, which is about a week, the hog is then bled again and this is continued until four bleedings have been made. Then the hog is re-hyperimmunized and bled four more times. This is continued until the tail becomes short, when the final bleeding is made by cutting the throat, and all of the blood is removed.

The blood from the tail and throat of the hyper-immunized hog is defibernated (the clot is removed) leaving the liquid portion of the blood, which is the serum. To this serum is added enough carbolic acid to make one-half of a one per cent solution. The acid is added as a preservative. This serum is a preventive to hog cholera and cannot produce hog cholera because it contains the anti-bodies which are antagonistic to the germs of hog cholera.

## VIRUS.

The virus used to hyper-immunize the immune hog is secured by injecting a small amount of virus (the liquid portion of the blood) from an acute case of hog cholera into a susceptible hog, or by exposing a susceptible hog to hog cholera infection. When the hog has developed an acute case of cholera, the hog is bled by the throat and the blood is then defibernated. The virus or liquid portion of the blood is injected direct or indirect into the circulation of the immune hog.

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FIGURE 11.—Bleeding by throat for virus.

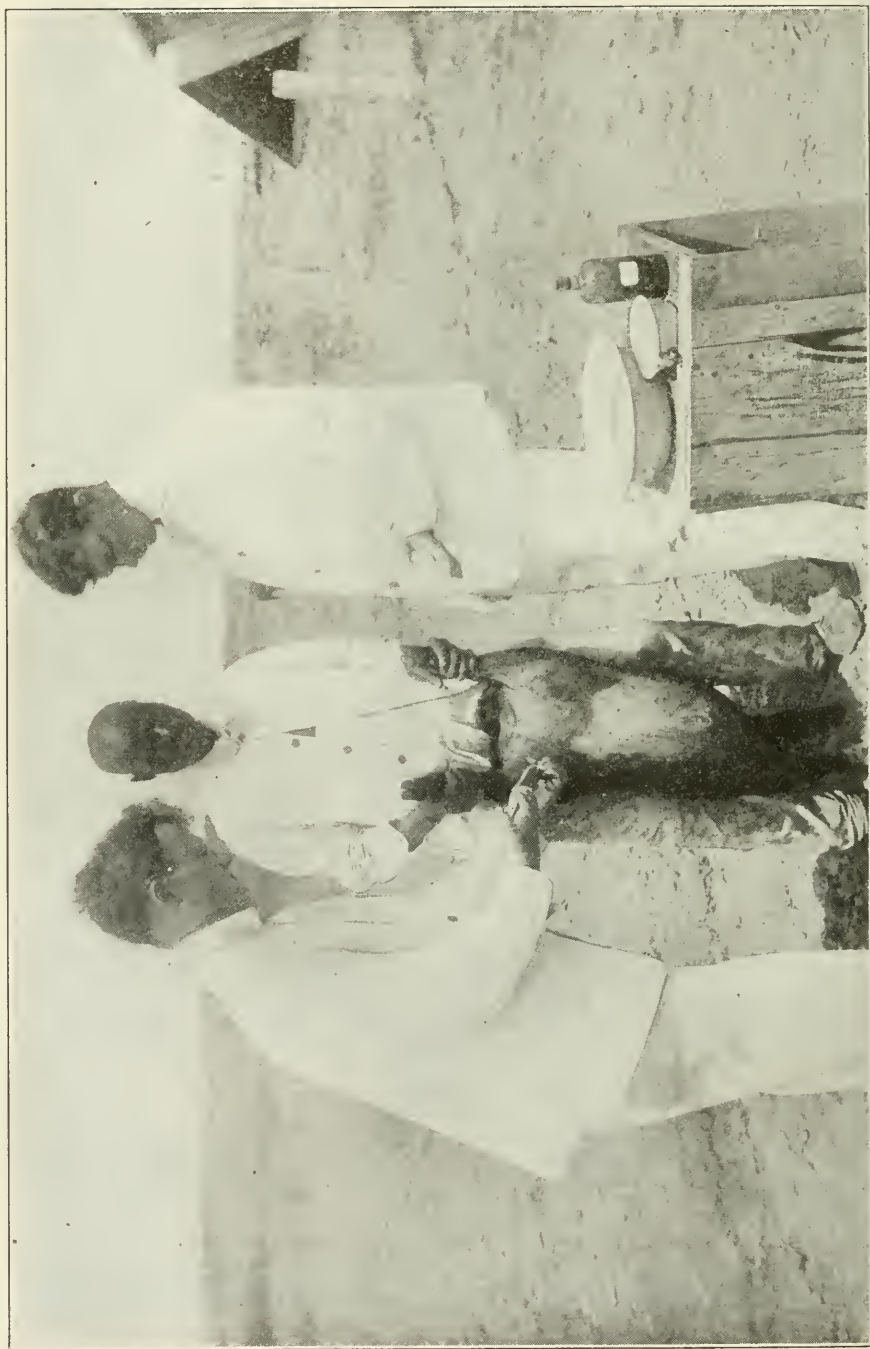


FIGURE 12.—One of the ways of vaccinating.

## ANTI-HOG CHOLERA SERUM.

*(The only known preventive for hog cholera.)*

There are thousands of dollars spent annually for so-called sure hog cholera "cures." Agricultural papers are full of very attractive advertisements of fake remedies. To spend money for such "fakes" is nothing less than throwing it away.

It would be well to bear in mind that all products advertised as "cures" for hog cholera are worthless; also that a large per cent of the serum and vaccines will not prevent hog cholera.

Anti-hog cholera serum, if properly prepared and administered will, without a doubt, prevent hog cholera but very little is claimed for it as a curative agent.

## WAYS OF VACCINATING.

There are two ways by which hogs may be vaccinated with anti-hog cholera serum, the Serum Alone Method and the Serum Simultaneous Method. The Serum Alone Method consists of injecting the required amount of serum into the tissues of the hogs with a hypodermic syringe. The Serum Simultaneous Method consists of injecting the serum as in the Serum Alone Method, but at the same time a small amount of virus is injected.

The Serum Alone Method only confers immunity for a very short period, varying from four to eight weeks, whereas the Serum Simultaneous Method confers immunity, varying from a few months in very young pigs to life immunity in older hogs.

As there is considerable danger attached to the Serum Simultaneous Method, it is not safe to put this method of treatment into the hands of persons who have not had special training for this purpose. This is so because a small per cent of the hogs treated by this method develop hog cholera and die. This is so when the method is applied by men who have had long training and wide experience in using the serum and virus. We think it would be a great mistake to distribute the virus with the serum over the State to any one applying for it. If this was done we would expect to see the entire State sooner or later "fired" with hog cholera. There is no danger of producing hog cholera by using the Serum Alone Method, and for this reason we think it is the only method to place in the hands of the untrained.

The serum is sent direct to any one ordering it, with full directions for using. If the directions are followed closely good results will follow. It is always better, whenever possible, to have some one inject the serum who has at least seen it injected, if they have not done so themselves. Our advice would be to employ a graduate veterinarian when possible and have him inject the serum for you.

## HOW AND WHEN TO USE SERUM.

The Serum Alone Method only gives temporary immunity lasting from four to eight weeks, an average of about six weeks. It is rather expensive to keep a herd of hogs immuned by his method. We believe it would be cheaper where a permanent herd is to be kept for breeding purposes

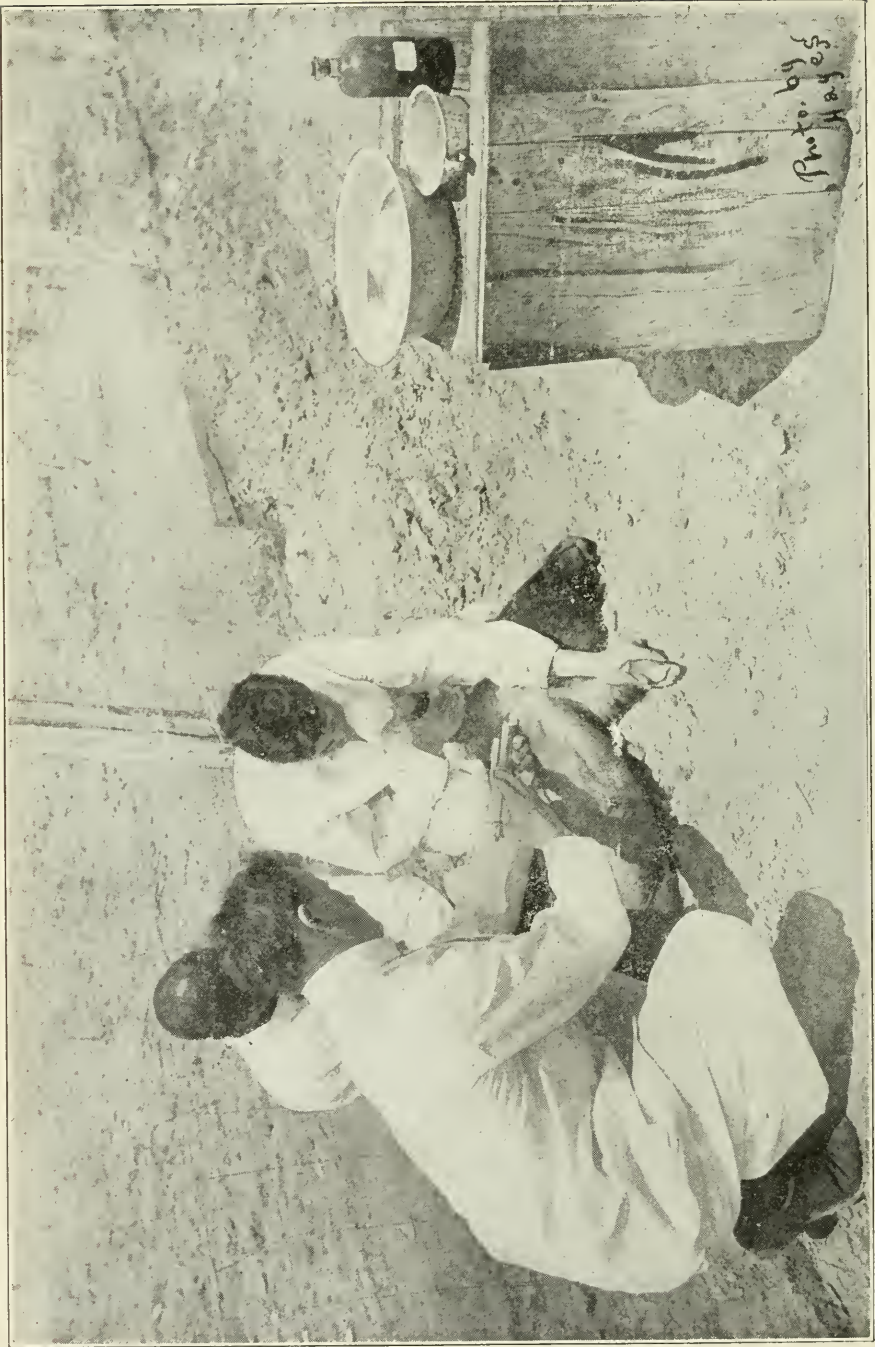


FIGURE 13.—Injecting serum into loose tissues between foreleg and body.

to use the Simultaneous or Double treatment. This would insure protection at all times to the foundation of the herd.

The owner of a herd of hogs should not delay any longer than possible in securing the serum and injecting his hogs when it becomes known that they have been exposed to cholera, or when it is known that cholera is in his community, if there is any possibility of the infection gaining entrance to his herd through any of the many channels of entrance.

When the serum is used shortly before or very soon after the hogs are exposed to cholera infection the per cent protected is often as high as a hundred, but usually ranges around 95 per cent. After cholera has gained entrance in a herd and a portion of the hogs are showing physical or thermal symptoms of cholera, the per cent saved of the remaining apparently well hogs will not be so high, but a good per cent of those showing no physical or thermal symptoms will be protected.

When a large number of hogs in a herd become sick and begin to die it is pretty safe to say that they are affected with hog cholera. Immediate steps should be taken to secure the serum and inject the remaining well hogs.

To inject the serum one must have a hypodermic syringe (preferably a 20 or 30 c.c. glass barreled one). This syringe should be sterilized by being boiled in water for fifteen or twenty minutes. Before using, the mouth of the serum bottle should be wiped off with a five per cent solution of carbolic acid and the serum then poured into the receptacle with a cover. Both the receptacle and cover should have been boiled in water for fifteen or twenty minutes and allowed to cool before pouring the serum into it. Keep the cover on all the time except when the serum is being poured into or taken from the receptacle. The hands of the person injecting the serum should be washed before beginning and kept clean all the time. Do not allow the syringe or needle to come in contact with soiled objects.

The serum is injected into the tissues either on the inside of the thigh or into the loose tissues between the foreleg and body. The needle is inserted perpendicularly to the depth of one-half or one inch, depending upon the size of the hog. The serum is then injected and the needle withdrawn. Before the needle is inserted the skin at the point selected should be washed with soap and water and then scrubbed with a reliable disinfectant, such as a five per cent solution of carbolic acid, lysol or creolin.

Hogs in infected herds showing a temperature above 104 degrees F. are considered to be affected with cholera. The hogs showing high temperatures should be given a double dose of serum; apparently well hogs in infected herds should be given more serum than hogs in non-infected herds. (See dose table.)

#### THE SERUM AS A CURE FOR HOG CHOLERA.

No claim is made that the serum will "cure" a well developed case of hog cholera. A small per cent of the hogs showing a temperature above 104 degrees Fahrenheit will, if given a large dose of serum, make



FIGURE 14.—The serum plant.

a recovery. We believe the per cent of recoveries will justify the expense of the serum used.

#### VACCINATING INFECTED HERDS.

Do not fail to take the temperature of all hogs in infected herds. Those showing a temperature of 104 degrees or higher should be given a double dose of serum.

Never use the Simultaneous treatment in infected herds (they already have enough infection). Hogs injected with a protective dose of serum and left in infected lots or pens for three weeks will, in all probability, contract enough infection to produce the same immunity as those treated with the Simultaneous method. However, one can never be sure of this.

#### THE DOSE OF SERUM.

Care should be used in estimating the weight of every hog injected because the amount of serum to be used will depend on the weight of the hog and not on the age. Always be certain not to underestimate the weight; it is much better to overestimate than to underestimate. If the weight is underestimated and too small a dose of serum is given, the hog will not be protected from cholera. There is no danger in giving an overdose of serum; the larger the dose the more certain the protection.

Avoid turning the hogs into muddy, filthy or dusty lots after they are injected. It is better to keep them in a lot for several days until the puncture wound caused by the needle has had time to heal. If the wound becomes infected abscesses may follow. When abscesses form they should be opened and washed with an antiseptic solution.

A complete and accurate record should be kept by every farmer using the serum. He should record the number of hogs that have died from hog cholera at the time the serum is injected; also keep a record of the number of sick hogs in the infected lots; how many treated with serum; and the number of both treated and not treated that die. Don't fail to take the temperature of all hogs in an infected herd. Those that show a temperature of 104 degrees Fahrenheit are considered affected with hog cholera.

#### THE SERUM PLANT.

The North Carolina Department of Agriculture has erected and equipped a modern anti-hog cholera serum plant. It is the Department's purpose to make and distribute a potent serum to the farmers of the State at cost of production.

In 1911 the charge for the serum was two and one-half cents per cubic centimeter. This has been gradually reduced until it is now being distributed for one and one-quarter cents per cubic centimeter, the cost of production.

#### TESTED SERUM.

All serum should be tested for potency before it is used in the field. Serum sent out by this Department is tested in the following manner. The bleedings from the tail and the final bleeding by the throat of a number of hyperimmune hogs are thoroughly mixed, which is then

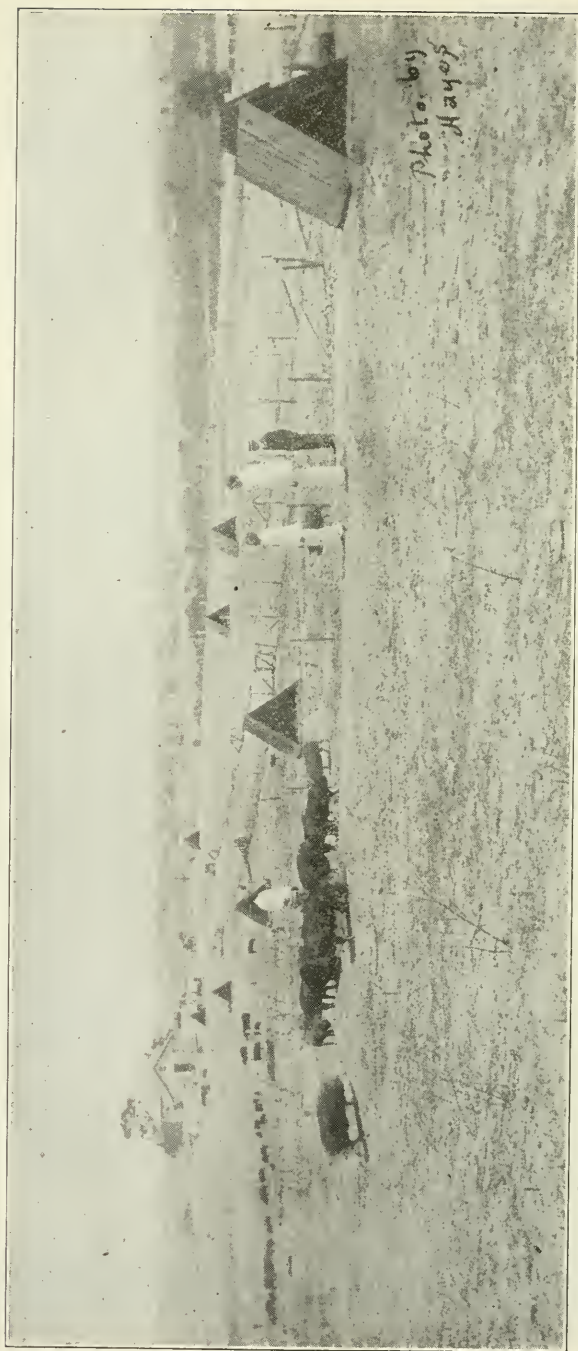


FIGURE 13.—South side of serum plant.

tested on susceptible pigs. The test is made by injecting two cubic centimeters of virus into each of four susceptible pigs (25 to 35 pounds) preferably from the same litter. These pigs are then injected with different amounts of serum. No. 1 would get two cubic centimeters of virus and twenty cubic centimeters of serum; No. 2, fifteen cubic centimeters of serum and two cubic centimeters of virus. No. 3, ten cubic centimeters of serum and two cubic centimeters of virus; No. 4 would get two cubic centimeters of virus and no serum. If No. 4 dies within fifteen days and Nos. 1, 2, and 3 show no signs of sickness, we then know that the virus used was virulent and that the serum protected Nos. 1, 2, and 3 from what would have been a fatal dose of virus.

#### DIRECTIONS FOR ORDERING SERUM.

The serum will be shipped, by express, C.O.D., to any one ordering it, unless check or money order accompanies the order. Do not fail to give correct address.

Always state correctly the amount of serum wanted, or give the weight of each hog to be treated. If a hypodermic syringe is desired, state so in your order, otherwise it will not be sent. A twenty cubic centimeter glass barreled syringe will be sent at cost, \$1.75, if ordered.

The serum will be shipped in the following size bottles:

30 c.c., 50 c.c., 100 c.c., 120 c.c., 150 c.c., 180 c.c., 200 c.c., 250 c.c., 500 c.c., 750 c.c., and 1000 c.c.,

The cost of the serum is one and one-quarter cents per cubic centimeter. No serum will be taken back; when the serum is placed in the express office it becomes your serum.

Address all communications for serum to the State Veterinarian, Department of Agriculture, Raleigh, N. C.

#### VACCINATION DOSES.

It requires more serum per pound of weight to "immunize" young pigs than is required to "immunize" older hogs.

	Cholera-free Herds.	Infected Herds.
Suckling pigs . . . . .	5 to 10 c.c.	10 to 15 c.c.
25 to 50 pounds . . . . .	20 c.c.	25 c.c.
50 to 100 pounds . . . . .	25 c.c.	30 c.c.
100 to 150 pounds . . . . .	30 c.c.	40 c.c.
150 to 200 pounds . . . . .	40 c.c.	50 c.c.
200 to 250 pounds . . . . .	50 c.c.	60 c.c.
250 to 300 pounds . . . . .	60 c.c.	70 c.c.
300 to 350 pounds . . . . .	65 c.c.	75 c.c.
350 to 400 pounds . . . . .	70 c.c.	80 c.c.
All over 400 pounds . . . . .	80 c.c.	90 c.c.

#### PENALTY FOR ALLOWING DISEASED HOGS TO RUN AT LARGE.

"If any person having swine affected with the disease known as hog cholera, or any other infectious or contagious disease, and discovering the same, or to whom notice of the fact shall be given, shall fail of neg-

lect for five days to secure the diseased swine from the approach or contact with other hogs not so affected, by penning or otherwise securing and effectually isolating them, so that they shall not have access to any ditch, canal, branch, creek, river, or other watercourse which passes beyond the premises of the owners of such swine, he shall be guilty of a misdemeanor, and upon conviction shall be fined not exceeding fifty dollars or imprisoned not exceeding thirty days."—*Section 3297 of the Revisal of 1905 of North Carolina; 1889, ch. 173, sec. 1; 1891, ch. 67, secs. 1, 3; 1903, ch. 106; 1899, ch. 47.*

PENALTY FOR FAILURE TO PROPERLY DISPOSE OF CARCASSES OF ANIMALS  
DYING FROM INFECTIOUS DISEASES.

"If any hog or other animal shall die with the hog cholera or other infectious disease, and the owner thereof shall fail to burn or to so bury the same as to secure it from the reach or contact with other hogs or other domestic animals of value, or if he shall throw or place such hog or other animal in any ditch, canal, branch, creek, river, or other watercourses passing beyond his own premises, he shall be guilty of a misdemeanor and upon conviction shall be fined not more than fifty dollars or imprisoned not more than thirty days."—*Section 3298 of the Revisal of 1905 of North Carolina; 1889, ch. 173, sec. 2; 1891, ch. 67, secs 2, 3; 1903, ch. 106; 1899, ch. 47.*

### LEAF TOBACCO SALES FOR MAY, 1914

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Pounds sold for producers, first hand.....	174,981
Pounds sold for dealers .....	33,257
Pounds resold for warehouse.....	2,360
<hr/>	
Total .....	210,598







**THE BULLETIN**  
OF THE  
**NORTH CAROLINA**  
**DEPARTMENT OF AGRICULTURE,**  
**RALEIGH**

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Vol. 35, No. 8.

AUGUST, 1914.

Whole No. 199.

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**CORN SILAGE AND COTTON-SEED HULLS  
FOR FATTENING BEEF CATTLE**



**Good Steers Properly Fed Bring Permanent Improvement on the Farm.**

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PUBLISHED MONTHLY AND SENT FREE TO CITIZENS ON APPLICATION.

Entered at the Post-office at Raleigh, N. C., as second-class matter,  
February 7, 1901, under Act of June 6, 1900.

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\*Assigned by the Bureau of Soils, United States Department of Agriculture.

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‡In cooperation with Bureau of Plant Industry, United States Department of Agriculture.

## LETTER OF TRANSMITTAL.

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HON. W. A. GRAHAM,  
*Commissioner of Agriculture,*  
*Raleigh, N. C.*

SIR:—I submit herewith manuscript for a bulletin on *Corn Silage and Cotton-seed Hulls for Fattening Beef Cattle*. This important experiment was made on the Iredell Test Farm during the winter of 1913-1914, and should be considered a report of the progress of the work, as plans are made for continuing these and similar experiments on the Iredell Test Farm until the prominent questions relating to the fattening of beef cattle during the winter months have been thoroughly and carefully studied.

I recommend the publication of this report as the August BULLETIN.

Very respectfully,

DAN T. GRAY,  
*Chief in Animal Industry.*

Approved for printing:

W. A. GRAHAM,  
*Commissioner of Agriculture.*

## SUMMARY STATEMENTS.

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The lot of cattle fed cotton-seed meal and corn silage made only slightly larger gains than those fed cotton-seed meal and cotton-seed hulls. Lot 1 made an average daily gain of 1.62 pounds and Lot 2 1.63 pounds during the experimental period of 112 days.

The steers in Lot 1 were fed an average of 21.95 pounds of cotton-seed hulls per steer daily during the experimental period. The steers in Lot 2 were fed an average of 42.46 pounds of corn silage per steer daily during the experimental period. According to the gains made, this showed a relative feeding value of approximately one pound of cotton-seed hulls to two pounds of corn silage.

It required 1,352.2 pounds of cotton-seed hulls in conjunction with 458 pounds of cotton-seed meal to make 100 pounds gain, and 2,611.4 pounds of corn silage in conjunction with 458 pounds of cotton-seed meal to make 100 pounds gain. This shows that it takes, on the average, about two pounds of corn silage to replace one pound of cotton-seed hulls under the conditions of this experiment.

It cost \$11.43 to make 100 pounds gain in the lot fed cotton-seed meal and cotton-seed hulls, and \$10.92 in the lot fed cotton-seed meal and corn silage, the difference being 51 cents per hundred pounds in favor of the corn-silage-fed cattle.

When the steers were finished, those fed cotton-seed hulls for roughage were valued at \$7.50 per cwt. and those fed corn silage \$7.70 per cwt. This decision was corroborated by the slaughter data obtained at the abattoir. The silage-fed cattle were thicker and more uniformly covered with fat.

The comparative profit per steer in Lot 1 fed cotton-seed hulls for roughage, eliminating freight, cost of labor, and bedding, was \$8.29 per steer. The comparative profit per steer in Lot 2 fed corn silage for roughage was \$11.36 per steer, showing a difference of \$3.07 in favor of the corn-silage-fed cattle.

The shipping data obtained on these cattle showed that the steers fed corn silage did not shrink any more than steers fed cotton-seed hulls under like conditions otherwise. The average net shrink per steer from Statesville, N. C., to Richmond, Va., was slightly less than 45 pounds.

# **CORN SILAGE AND COTTON-SEED HULLS FOR FATTENING BEEF CATTLE**

WORK CONDUCTED AT

**IREDELL TEST FARM, STATESVILLE, N. C.**

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BY

R. S. CURTIS, L. W. SHOOK, F. T. MEACHAM.

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## **INTRODUCTION.**

A great deal of interest has developed recently in the winter feeding of beef cattle. This is due to two conditions: first, because of the desire to incorporate the fertilizing value of cotton-seed meal in the form of manure, and, second, to utilize cheap or unsalable feeds in the roughage part of the ration and in the bedding to add humus to the soil. There is thus a twofold reason for feeding cattle, either of which is of much greater importance than ordinarily considered. Experimental workers and farmers who have had experience will admit that under present conditions there is, many times, no profit in the winter cattle-feeding industry, excluding the value of the manure. The manurial benefit to the land, however, is considered to be of unquestionable value.

This brings up the problem of the most feasible plan to follow in preparing fattening cattle for the market. The southern farmer usually has a number of roughage feeds available, and with comparatively little effort others of value can be provided. Cotton-seed hulls is the standard roughage feed throughout the South, and while acceptable in many respects as a roughage feed, it must be purchased direct from the cotton-seed oil mills. It is generally admitted that the farmer should not purchase roughage feeds, although cotton-seed hulls can sometimes be used to advantage either as a whole or a part of the roughage ration.

One of the principal drawbacks to the use of cotton-seed hulls is the fact that they cannot be used in conjunction with cotton-seed meal for a sufficient length of time to put cattle in prime market condition. For this reason it is an important problem to determine whether a substitute can be profitably used, either as a whole or a part of the roughage ration. The following results were obtained from an experiment designed to determine the feasibility of the plan suggested.

## **LOCATION OF WORK.**

The results of the work herein reported were obtained from two carloads of forty-eight grade Shorthorn steers fed on the Iredell Test Farm at Statesville, N. C. The results were obtained under the best of experimental conditions. The feeding was done by a competent man during the entire feeding period of four and one-half months.

Work of this character in Iredell County is of unusual importance, owing to the natural conditions for cattle feeding and the great interest which was manifested in this experiment. At the close of the experiment a meeting was held to explain the results which had been obtained. Although an inclement day, a very acceptable number of farmers was present to learn the results and see the finished cattle.



FIG. 2. A Group of the Steers Fed Cotton-seed Meal and Cotton-seed Hulls.

The conditions in this and surrounding counties for winter cattle feeding are especially favorable because of the proximity to oil mills and the fact that an unusual amount of roughage feed is produced which is available both for feeding and bedding purposes. While the local markets for cattle are not the most desirable, easy access can be had to the best eastern markets.

#### OBJECTS OF EXPERIMENT.

The fundamental object of the experiment was to determine the comparative value of corn silage and cotton-seed hulls each in conjunction with a like amount of cotton-seed meal. This problem redivides itself into two sub-problems, the first being to determine the average daily and total gains made, the cost of same, and, second, the market value of the finished animals fed on the two rations in conjunction with cotton-seed meal.

The importance of this problem is not fully recognized by the farmer until his finished animals are offered for sale. The average farmer is usually not fully acquainted with market conditions. He is, therefore, unable to fully appreciate the value of a feed which will finish cattle in prime condition and enable him to command remunerative prices. Sufficient importance is not attached to the difference between producing gain on an animal and obtaining a wide margin, that is, the difference between the buying and selling price. Some feeds make acceptable gains, but do

not produce a desirable finish, upon which the amount of margin depends almost wholly. These factors thus briefly explained are the important objects of the work.

#### PLAN OF WORK.

The experiment was planned so that every condition would be the same in each lot of cattle except the variation in the roughage rations, which was the real nucleus of the experiment. The cattle were divided into six pens of eight steers each. Three pens of cattle were fed corn silage and three pens cotton-seed hulls, thus making a car-load in each lot. Two pens of the corn-silage-fed cattle and two pens of the cotton-seed-hulls-fed cattle were fed on the south side of the cattle barn. The third pen of corn-silage-fed and cotton-seed-hulls-fed cattle were fed on the north side of the barn. All shelter and exposure conditions were therefore exactly the same.

The cattle were divided into the two lots of twenty-four head each as equally in weight, quality, and condition as possible. The preliminary rations were the same for each lot. This period extended from October 15, 1913, to November 2, 1913, inclusive, the total preliminary period being 19 days. During this time the roughage ration remained the same for all the cattle, and the cotton-seed meal was increased uniformly toward the standard or experimental ration, which was 7.5 pounds per animal daily.

TABLE 1—KIND AND AVERAGE QUANTITY OF FEEDS GIVEN PER STEER DAILY DURING THE EXPERIMENTAL PERIOD.

Period.	Lot 1 (24 Steers).	Lot 2 (24 Steers).
November 3, 1913, to February 22, 1914—112 Days.	7.45 pounds cotton-seed meal... 21.95 pounds cotton-seed hulls...	7.45 pounds cotton-seed meal. 42.46 pounds corn silage.

The foregoing table brings out clearly the method of comparison. The daily cotton-seed meal ration is the same for each lot, the only variation being in the amount of roughage feeds fed as indicated.

At the beginning of the final or experimental period one lot of cattle was put on cotton-seed hulls and the other lot on corn silage. This marked the date of comparative results herein given. The increase in cotton-seed meal was continued until November 15, when all the cattle were placed on the standard ration of 7.5 pounds per animal daily. The ration of each lot was increased to 8 pounds on January 26, 1914, just four weeks prior to the close of the experiment. With the exception of the last three days of the feeding period the rations were continued as outlined. On February 23 they were changed somewhat to prepare the steers for shipment. This consisted in a reduction of the cotton-seed meal and the introduction of cotton-seed hulls in the ration of the corn-silage-fed cattle.

The comparative results as given in this bulletin include the data from November 3, 1913, to February 22, 1914, inclusive, making the total experimental period 112 days. The data given in the financial statements



FIG. 3. A Group of the Steers Fed Cotton-seed Meal and Corn Silage.

includes all items of expenditure from the time the cattle were loaded for shipment to the feed lot until they were loaded and turned over to the commission buyer at the local shipping station.

#### LENGTH OF EXPERIMENT.

The length of the experiment has been treated elsewhere in considerable detail. The preliminary period was 19 days, the experimental period 112 days, and the period preparatory to shipment 3 days, making a total feeding period of 134 days. The most important point to bring out in this connection is the fact that the experimental period was not of sufficient length to bring out the characteristic difference in the value of the two roughage feeds used.

Former experiments\* show that for about 100 days the results obtained from using cotton-seed hulls and corn silage in conjunction with cotton-seed meal are not greatly different. It is after the expiration of the one-hundred-day period or thereabouts that marked differences in the value of these feeds usually occur. Even under the conditions of this experiment, however, there was a marked difference in the results, but more especially in the value of the finished animals. The difference in the gains was not as great as would have been likely had the feeding been continued for a longer period. The results under the conditions of the experiment were not materially different than anticipated.

\*N. C. Exp. Sta. Bulletins, 218-222.

### KIND OF STEERS USED.

The steers used in this work were purchased in the western or beef cattle producing section of this State. They were classed as 900-pound feeders. When taken from the pasture in the mountains they weighed slightly under 920 pounds per head. The steers were an average grade of 900-pound feeders usually secured in this State, there being a moderate variation in weight and quality. When the cattle were divided these qualities were apportioned equally in each of the two lots fed cotton-seed hulls and corn silage. The cattle were dehorned grade Shorthorns, and reasonably uniform in weight, quality, and condition at the beginning of the feeding experiment.

### SHELTER AND WATER SUPPLY.

The cattle were fed in a closed barn with a lean-to shed on the south side, as shown in the illustration. Each of the stalls, including both the barn and shed portion, was twenty feet wide and twenty-six feet long. The feed troughs extended entirely across the end of the stalls adjacent to the alleyway, making two and one-half feet of feeding space for each

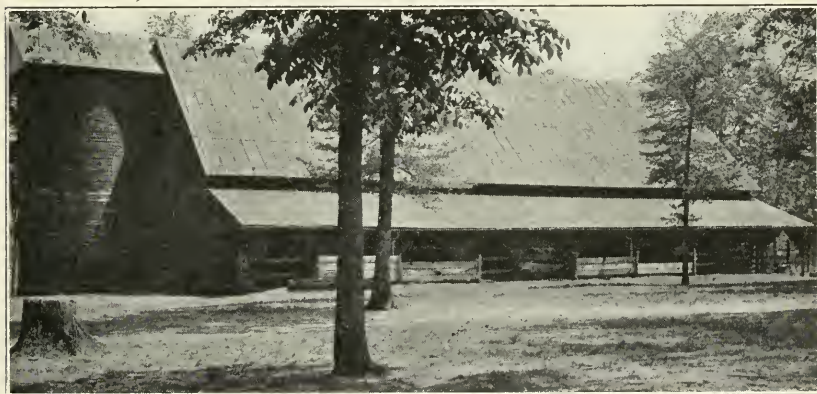


FIG. 4. Barn in Which Steers Were Fed.

steer. Both the steers and the manure were kept under cover the entire time except during the preliminary period in which the steers were left in the pasture during the daytime. The only exposure was the small amount of open space at each end of the shed and on the south side of same where water was provided.

The water was furnished from that collected from the barn roof and from a well, from which it was pumped by a gasoline engine. The cattle had water before them at all times. This is a very important matter both for the farmer and the experimental worker. Cattle fed cotton-

seed hulls should have special attention, owing to the dry, undigestible nature of this roughage feed. The writers desire to emphasize the necessity of a plentiful and regular water supply for steers, especially since the idea is prevalent that cattle need only a limited amount of water at certain times in the day. Better gains will always be secured when the steers have free access to water.

#### BEDDING MATERIAL.

The bedding material used consisted of leaves, wheat straw, and corn stover. A sufficient quantity was used to keep the cattle reasonably clean and conserve the liquid manure. Bedding is rather difficult to obtain in many instances for winter cattle feeding work. For this reason, and the fact that the manure can be so much better saved, it is advisable to feed entirely under cover, with the exceptions following. Work is under way in sandy sections of the State to determine the feasibility of feeding cattle on the land where the manure is to be applied. \*A brief summary of this work has just been published. It is impossible to follow this practice in the clay sections, however, because of tramping and puddling the soil.

In this feeding experiment there was no waste roughage, so that the entire amount of bedding was supplied especially for the purpose. When corn stover is fed, a large quantity of the coarser material not eaten by the cattle can be utilized for bedding purposes. These cattle were bedded on the average about once each week. During bad weather material was supplied at shorter intervals. During the first part of the work leaves were used largely. During the last part wheat straw and corn stover were used.

#### VALUATION OF FEEDS.

A standard market value was placed on each of the feeds used. The valuations given include the cost of delivery to the farm barn. The cotton-seed meal was rated at \$27.75 per ton, the cotton-seed hulls at \$7.50 per ton, and the average valuation of corn silage was placed at \$3.50 per ton. The latter figure fixing the value of corn silage may be too high under some conditions in the State and too low in others. This valuation was fixed as an average for the whole State.

#### METHOD AND TIME OF WEIGHING CATTLE.

In the financial statements the mountain weights of the cattle are used for making the calculations on the initial cost. The final weight is the same as that used in the discussion of the experimental results.

In the beginning of the experimental period the cattle were weighed on three consecutive mornings before being fed and watered, and the average of these three weights taken for the initial experimental weight.

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\*N. C. Exp. Sta. Circular-Letter.

The monthly weights and the final experimental weights were made always under normal conditions. The cattle were weighed each morning as nearly the same time as possible before any feed or water had been given.

#### METHOD OF FEEDING.

When the cattle first arrived at the farm they were turned on a small pasture, where they remained in the daytime during the preliminary period. After this period of nineteen days they were placed in the barn with eight steers in each of six pens and fed two equal feeds regularly each morning and evening. The roughage was given in moderately large quantities and increased gradually until a full feed of corn silage and cotton-seed hulls were being fed. This consisted on the average during the experimental period of 21.95 pounds of cotton-seed hulls and 42.46 pounds of corn silage. This is about the proportion in which these two feeds are usually given in practical feeding work.

TABLE 2—AVERAGE DAILY AMOUNT OF COTTON-SEED MEAL, COTTON-SEED HULLS AND CORN SILAGE FED PER STEER DAILY BY 28-DAY PERIODS, INCLUDING THE PRELIMINARY AND EXPERIMENTAL PERIOD.

Date Periods.	Cotton-seed Meal.		Cotton-seed Hulls.		Corn Silage.	
	Lot 1.	Lot 2.	Lot 1.	Lot 2.	Lot 1.	Lot 2.
19 days.....	2.20	2.20	*11.67	-----	†13.01	14.80
28 days.....	6.79	6.79	22.54	-----	-----	38.21
28 days.....	7.50	7.50	22.47	-----	-----	41.74
28 days.....	7.50	7.50	20.89	-----	-----	45.00
28 days.....	8.00	8.00	20.39	-----	-----	44.80

\*Fed two and one-half days.      †Fed sixteen and one-half days.

The cotton-seed meal was fed first at the rate of 1 pound per animal daily, and increased gradually until the standard ration of 7.5 pounds per steer daily was reached. In both cases the cotton-seed meal was fed, mixed with the cotton-seed hulls and corn silage. The roughage feeds were placed in the troughs first, after which the meal was spread over them and mixed evenly and thoroughly. Special attention is called here to the necessity of mixing the cotton-seed meal and roughage feeds thoroughly. This will prevent some steers from getting more than their share of the meal, which may thus cause cotton-seed meal sickness or an uneven finish. Thorough mixing is an inducement for steers to eat all of their roughage, besides furnishing in each case a very desirable dilutant for the cotton-seed meal. Successful feeding of cotton-seed meal depends on two factors: First, the meal must be fed in small quantities in the beginning and gradually increased; second, it must be thoroughly mixed with coarse feeds such as those used in these experiments.

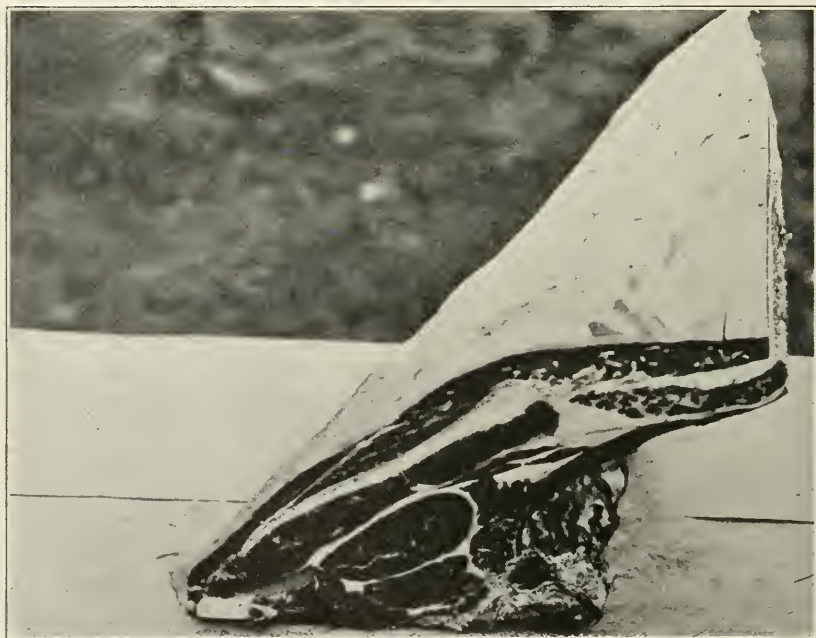
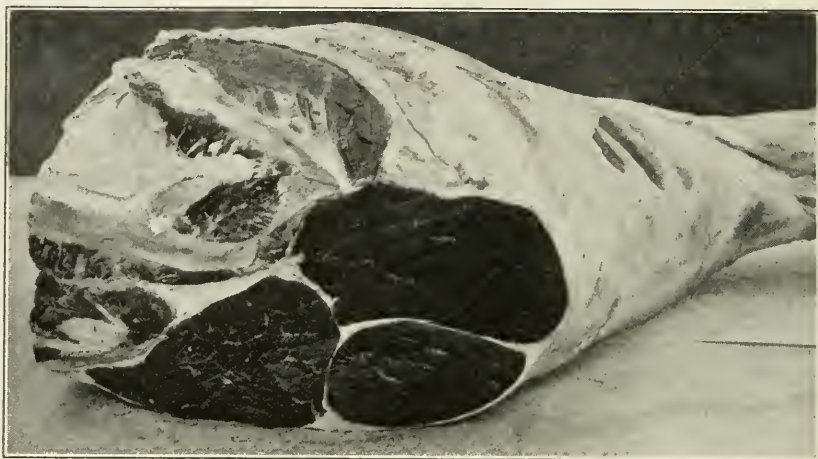


FIG. 5. The Condition of the Round and Rib of a Representative Steer Taken from Lot 1 at Beginning of Experiment.  
Ration, Cotton-seed Meal and Cotton-seed Hulls.



FIG. 6. The Condition of the Round and Rib of a Representative Steer Taken from Lot 2 at Beginning of Experiment.  
Ration, Cotton-seed Meal and Corn Silage.

## DISCUSSION OF RESULTS.

In comparing the figures on the comparative profit per steer in each lot, it should be kept clearly in mind that only the cost of the steers, the cost of feed, and selling price are considered. The freight, labor, bed-

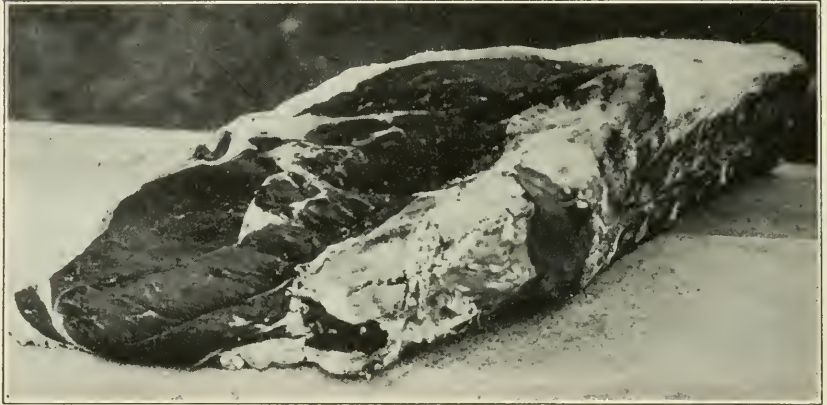


FIG. 7. The Condition of the Loin of a Representative Steer Taken from Lot 1 at Beginning of Experiment.

Ration, Cotton-seed Meal and Cotton-seed Hulls.

ding, and manure are all eliminated from this discussion. Since this is a determination of the comparative cost, valuation, and profit of the finished steers, these items are all eliminated to avoid confusion. This is customary in experimental work of this kind. Even though these items



FIG. 8. The Condition of the Loin of a Representative Steer Taken from Lot 2 at Beginning of Experiment.

Ration, Cotton-seed Meal and Corn Silage.

were included, the comparative results would be the same. However, the total profit per steer would be reduced. The final results in either case lead to the same conclusions.

In the financial statements all items of expense are included from the time the cattle were loaded in the mountains until they were loaded for shipment to the final consuming market. The only difference in these two statements, that is, the experimental data and the financial statement, is that the first is comparative and the second absolute. The experimental statements show what would result if a certain practice was followed on the farm, while the financial statements show what actually occurred in this particular experiment from a practical standpoint.

All of the fundamental data obtained during the experimental period are summarized in the following table. The value of the cattle at the beginning of the experiment was the same, while at the close there was a difference of 20 cents per cwt. affixed by three parties in close touch with market conditions. The initial weight of the cattle was practically the same, while there was a variation of only three-tenths of a pound in the average total gain per steer.

TABLE 3—SUMMARY OF COMPARATIVE RESULTS OBTAINED FROM FEEDING BEEF CATTLE.

	November 3, 1913, to February 22, 1914, Inclusive—112 Days.	
	Lot 1— 24 Steers.	Lot 2— 24 Steers.
	Cotton-seed Meal and Cotton-seed Hulls.	Cotton-seed Meal and Corn Silage.
Initial value per cwt. ....	\$ 5.75	\$ 5.75
Average initial weight, pounds.....	882.4	883.8
Average final weight, pounds.....	1,064.0	1,066.0
Total gain per steer, pounds.....	181.6	182.2
Average daily gain per steer, pounds.....	1.62	1.63

AVERAGE DAILY FEED PER STEER IN POUNDS.

Cotton-seed meal.....	7.45	7.45
Cotton-seed hulls.....	21.95	-----
Corn silage.....	-----	42.46

AVERAGE AMOUNT OF FEED USED PER HUNDRED POUNDS GAIN.

Cotton-seed meal.....	458.8	458.0
Cotton-seed hulls.....	1,352.2	-----
Corn silage.....	-----	2,611.4

COST OF FEED, VALUATION OF STEERS AND PROFIT.

Cost of feed per cwt. gain.....	\$ 11.43	\$ 10.92
Valuation of steers per cwt.....	7.50	7.70
Profit per steer (comparative).....	8.29	11.36
Profit per steer, all expenses included (per financial statement).....	.64	3.72
Average profit per steer, exclusive of manure.....	2.19	
Average profit per steer, including manure.....	11.84	



FIG. 9. The Interior of a Slaughtered Carcass from Lot 1 at the Close of the Experiment.  
Ration, Cotton-seed Meal and Cotton-seed Hulls.



FIG. 10. The Exterior of a Slaughtered Carcass from Lot 1 at the Close of the Experiment.  
Ration, Cotton-seed Meal and Cotton-seed Hulls.

One important factor brought out was the relation between cotton-seed hulls and corn silage for steer feeding purposes. From the experiment it is shown that two pounds of corn silage will replace one pound of cotton-seed hulls. From these figures corn silage can be charged at \$4 per ton against steers when cotton-seed hulls sell at \$8 per ton, which was about the average price paid this year by most of the feeders in the State. Under these conditions the feeder would still have the advantage of getting the extra quality and finish obtained from the use of corn silage. A difference of 20 cents per cwt. would mean an approximate increased profit of \$50 per car on every load of steers fed. When cotton-seed hulls can be purchased for less than \$8 per ton these figures would be altered to the extent of the difference in the price of the hulls.

The cost per hundred pounds gain on the corn-silage-fed cattle was 51 cents less than on the cattle fed cotton-seed hulls. The difference in cost is not as great as ordinarily obtained in feeding steers under these conditions. The longer the feeding period in an experiment of this character usually the greater the difference in the average cost per hundred pounds gain. The profit per steer was \$3.07 more on the cattle fed corn silage than those fed cotton-seed hulls. The relative difference only should be considered in studying these latter figures, as freight, labor, and bedding are not charged against the cattle.

#### AVERAGE DAILY GAINS DURING EXPERIMENTAL PERIOD.

The following table shows the gains by months of the two lots of steers fed cotton-seed hulls and corn silage. The average of one of the three pens of corn-silage-fed cattle was very low the fourth month. This makes the average for the lot during the fourth month less than the average for the lot on cotton-seed hulls. This is an unusual condition. However, the fault was not with the entire lot of corn-silage-fed cattle. The two other pens in this lot made normal gains during the fourth month. The almost inappreciable gain of the one pen reduces the average to .17 pounds less than the average for the lot of cattle fed cotton-seed hulls. The average gain for the whole period of four months is slightly more for the corn-silage-fed steers.

TABLE 4—AVERAGE DAILY GAIN PER STEER BY MONTHS DURING THE EXPERIMENTAL PERIOD.

November 3, 1913, to February 22, 1914, Inclusive—Period of 112 Days.	Average Daily Gain per Steer.	
	Lot 1.	Lot 2.
First month.....	1.86	1.73
Second month.....	1.72	1.96
Third month.....	1.82	1.90
Fourth month.....	1.09	.92
Average.....	1.62	1.63

Former experiments\* show that if cattle are fed longer than four months under the conditions which existed in this experiment the corn-silage-fed cattle will continue to gain and increase in value for thirty to sixty days longer, while those fed cotton-seed hulls will decrease materially in gains at this stage, and consequently in market value. Market conditions, however, made it necessary to dispose of these cattle before the expiration of the full experimental period.

#### VALUATION OF CATTLE.

The entire number of cattle was sold for \$7.60 per cwt. at the farm, weighed up after twelve hours yarding from feed and water. The valuations placed on each lot of twenty-four cattle was \$7.50 per cwt. for the cotton-seed-hulls-fed cattle and \$7.70 per cwt. for the corn-silage-fed

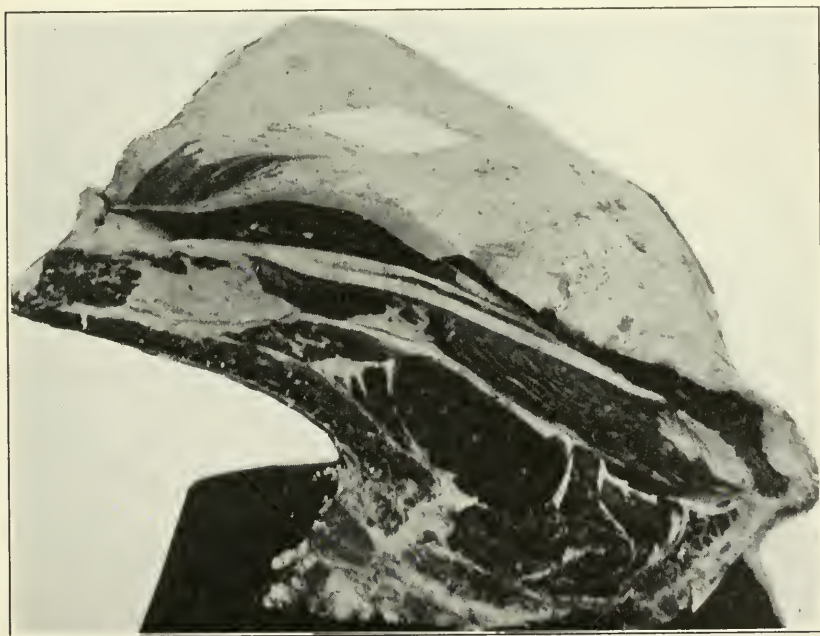


FIG. 11. The Condition of the Rib Cut Taken from a Steer in Lot 1 at Close of Experiment.  
Ration, Cotton-seed Meal and Cotton-seed Hulls.

cattle. This difference was clearly apparent to all parties who saw them. The difference in price was established by three parties in close touch with market conditions.

The corn-silage-fed cattle were in better condition at the time they were sold, having a thicker, smoother, and more uniform distribution of fat. All outward indications of condition showed the corn-silage-fed

\*N. C. Exp. Sta. Bulletins, 218-222.

cattle to be in much better market condition. The cotton-seed-hulls-fed cattle did not show the sleek, smooth condition of skin and hair characteristic of well-finished animals. The supposition that cattle fed corn silage shrink abnormally in transit was not borne out by the data obtained on these steers. While the cattle were not divided in the cars the same as they were fed in the pens, the average net shrink was only 45 pounds per head between Statesville, N. C., and Richmond, Va. Considering that they were on the road sixty hours, a lighter shrink would not have been anticipated even on cattle fed entirely on dry roughage feed.

#### COMPARATIVE FINISH OBTAINED.

At the time these cattle were placed on feed one representative steer was taken from each lot and slaughtered to determine the condition of the animals. This was for the purpose of getting photographs and also for making a study of the admixture of flesh and fat. The condition of these two animals in this respect is brought out in the table descriptions and photographs of the cuts herein shown.

#### INITIAL AND FINAL SLAUGHTER DATA.

The two representative steers used to determine the initial slaughtered condition of the two lots of cattle weighed 1,820 pounds after a drive of 17 miles to Asheville, N. C., where they were slaughtered. After arriving at Asheville, Steer 1 weighed 820 pounds and Steer 2 weighed 890 pounds, or a total of 1,710 pounds. This showed a total shrink of 110 pounds from the farm to the slaughter-pens.

Steer 1 was blocky and in average condition of flesh. The animal was reasonably representative of the steers in Lot 1 fed cotton-seed meal and cotton-seed hulls. Steer 2 was somewhat more rangy, with less condition than Steer 1. This favored condition, however, is always provided in an experiment where it is necessary to deal with comparisons. While an average of these dressing percentages was used, the steer representing the cotton-seed-hulls-fed cattle had the advantage in the beginning over the one representing the corn-silage-fed cattle.

These two steers were slaughtered on November 8, the day following their arrival at the slaughter-house. This was five days later than the inauguration of the experimental work at the State Test Farm. The dressing percentages are based on the live weights taken the same morning the steers were slaughtered. Before slaughtering, the judges of these animals made a difference of one-fourth of a cent per pound in favor of Steer 1. After slaughtering, however, there was a greater difference than anticipated, owing to the greater amount of outside and internal fat on Steer 1. The meat of both steers had a bright red color and a good texture. However, Steer 1 was considered to be worth one-half cent per pound more live weight than Steer 2, owing largely to the amount and condition of the fat covering.

The finished cattle when judged alive in the feed lots just prior to shipment showed the corn-silage-fed steers to be fully 20 cents per hundred better than the cotton-seed-hulls-fed steers. This was borne out by the examination made at Jersey City, N. J., where one car-load of the cattle was slaughtered. The other load of steers was sold to local butchers in Richmond, Va., so that accurate slaughter data could not be obtained. The corn-silage-fed cattle were thicker and more uniformly covered than those fed cotton-seed hulls. The illustrations show a more uniform distribution of fat, both on the interior and exterior of the sides. The outside fat is thicker, and there is a better marbled condition.

TABLE 5—DRESSING PERCENTAGE OF STEERS AT BEGINNING AND ENDING OF EXPERIMENT.

	Lot 1—Cotton-seed-hulls-fed Cattle.			Lot 2—Corn-silage-fed Cattle.		
	Live Weight.	Dressed Weight.	Average Dressing Percentage.	Live Weight.	Dressed Weight.	Average Dressing Percentage.
Average dressing percentage of two steers at beginning of experiment.....	850	435	52.24	800	427	52.24
	800	427		850	435	
Average dressing percentage of steers in each lot at close of experiment.....	33,310	18,164	54.53	12,700	7,164	56.41

The average dressing percentage of the twelve cattle fed on cotton-seed hulls was taken with nineteen other steers with which they were shipped from Richmond to Jersey City. These steers were of practically the same grade and quality as the twelve steers with which they were sold and weighed. The twelve steers fed on corn silage were weighed together alive, and when dressed, so that the average dressing percentage given is exact for this lot.

#### COMPARATIVE PRICES RETURNED FOR FEEDS USED.

It is interesting and instructive information to know the prices returned for certain feedstuffs when marketed through farm animals. The following table shows the prices obtained in this work when feeds are charged at varying prices. The figures written in *italics* indicate the market prices charged in this work and the prices returned for supplementary feeds under these conditions.

In other sections of the State where the prices of feeds vary somewhat these figures will enable the reader to approximate the results which could be obtained in cattle feeding. In all cases the feeds returned more than their estimated market value. Charging cotton-seed hulls at \$7.50 per ton, the cotton-seed meal returned \$30.34 for each ton fed. When



FIG. 12. The Interior of a Slaughtered Carcass from Lot 2 at Close of Experiment.  
Ration, Cotton-seed Meal and Corn Silage.



FIG. 13. The Exterior of a Slaughtered Carcass from Lot 2 at Close of Experiment.  
Ration, Cotton-seed Meal and Corn Silage.

cotton-seed meal was charged at \$27.75 per ton, the cotton-seed hulls returned \$8.38 per ton. When corn silage was charged at \$3.50 per ton, the cotton-seed meal returned \$37.71 per ton. Likewise when the cotton-seed meal was charged at \$27.75 per ton, the corn silage returned \$5.25 per ton. All of these figures are exclusive of the manurial value of the feeds.

TABLE 6—COMPARATIVE PRICES RETURNED FOR EACH TON OF THE VARIOUS FEEDS USED WHEN MARKETED THROUGH STEERS.

		Market Price of Feed Per Ton.	Price Returned for Each Ton of Feed.
Lot 1.	Price returned for each ton of cotton-seed meal when fed with cotton-seed hulls at different market prices.	Cotton-seed hulls—	Cotton-seed meal—
		\$ 6.00	\$ 34.76
		7.50	30.34
		9.00	29.92
	Price returned for each ton of cotton-seed hulls when fed with cotton-seed meal at different prices.	Cotton-seed meal—	Cotton-seed hulls—
		25.00	9.31
		27.75	8.38
		30.00	7.61
Lot 2.	Price returned for each ton of cotton-seed meal when fed with corn silage at different prices.	Corn silage—	Cotton-seed meal—
		3.00	40.56
		3.50	37.71
		4.00	34.86
	Price returned for each ton of corn silage when fed with cotton-seed meal at different prices.	Cotton-seed meal—	Corn silage—
		25.00	5.73
		27.75	5.25
		30.00	4.85

#### APPLICATION OF RESULTS.

The results of an experiment of this nature are of great importance to the farmer who expects to cater to a discriminating market. Feeders who handle native cattle, or feed in less than car-load lots, cannot use corn silage as economically as the type of feeder formerly described. This is largely because local markets will not pay for extra quality and finish such as that obtained with corn silage.

Where good, thrifty, high-grade steers are fed, such as those for which a premium is paid on a central market, corn silage from the results of this and other experiments can be used with economy and profit.\* This experiment, in conjunction with a number of others carried on by the writers, shows that corn silage is the best supplementary feed to use with cotton-seed meal. The reasons why are explained elsewhere in detail in this bulletin.

\*N. C. Exp. Sta. Bulletins, 218-222.

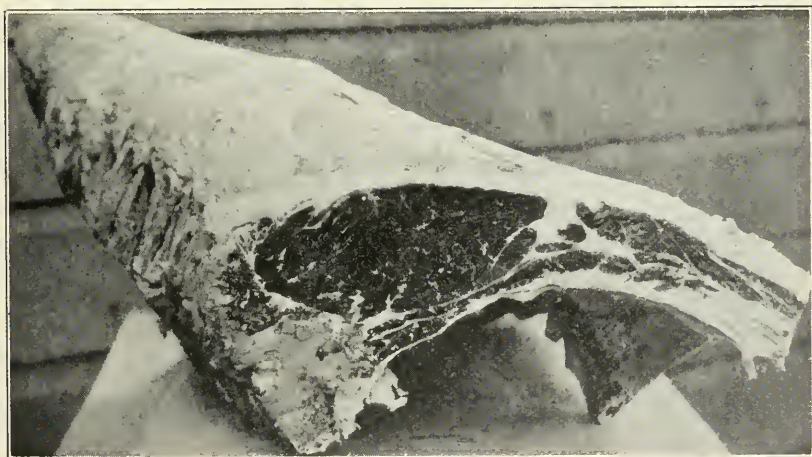
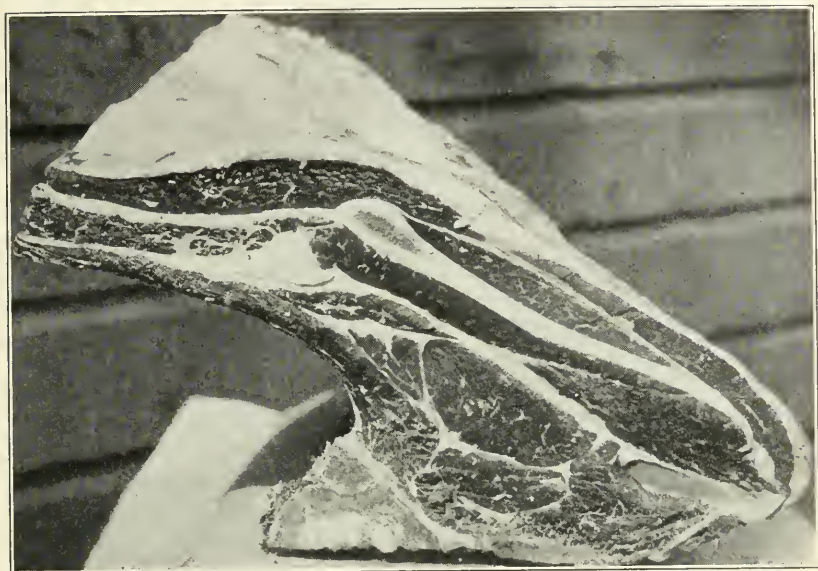


FIG. 14. The Condition of the Rib Cuts Taken from a Steer in Lot 2 at the Close of Experiment.  
Ration, Cotton-seed Meal and Corn Silage.

All cattle feeders in the State have access to the best eastern markets, either through buyers or direct shipments. The results of this experiment show that cattle fed a straight cotton-seed meal and hulls ration will not command a premium like those fed cotton-seed meal and corn silage. Steers which are short-fed from ninety to one hundred and twenty days and marketed locally can be fed satisfactorily on a straight cotton-seed meal and hulls ration. The addition of corn silage even during this short period, however, would give more finish than otherwise. The economy of this practice would depend entirely on the relative market value of cotton-seed hulls and corn silage. If cotton-seed hulls are high in price and corn silage is available, it would likely be economy to use corn silage, at least for part of the roughage ration. If cotton-seed hulls are low in price, it would not be economy to use corn silage unless the cattle were to be long-fed and sold on a discriminating market. Otherwise a straight cotton-seed meal and hulls ration would be more practical. These are factors which depend entirely on the kind of cattle used, the length of the feeding period, the relative cost of the roughage feeds and the place where the cattle are marketed.

#### FINANCIAL STATEMENTS.

The financial statements given herein are furnished entirely for the benefit of the farmer or practical feeder. This data has no relation whatever to the comparative results recorded formerly in the bulletin. These statements following include all items of expense which would naturally be incurred by the practical cattle feeder. Special attention has been given to these statements to bring out in detail the difference between cotton-seed hulls and corn silage for feeding solely with cotton-seed meal. The market value of corn silage is figured at three prices to suit all conditions in the State.

The advisability of using corn silage exclusively with cotton-seed meal has not been fully established. The writers have in mind some extensive experiments to determine the feasibility of feeding cotton-seed hulls with the cotton-seed meal for ninety to one hundred days, after which corn silage will be substituted wholly or in part for the cotton-seed hulls. This is based on the fact that cotton-seed hulls and corn silage will give about the same results for the period above mentioned. After this, however, the corn silage begins to show a decided value. As far as the results herein reported are concerned, the value of corn silage as a sole roughage feed during the entire feeding period is clear.

## FINANCIAL STATEMENT.

LOT 1—24 STEERS, FED COTTON-SEED MEAL AND COTTON-SEED HULLS.

Cotton-seed Hulls Figured at Standard Price of \$7.50 Per Ton.

## EXPENDITURES:

To 24 steers, 22,058.5 pounds, @ \$5.75 per cwt.....	\$ 1,268.36
" freight on above—Clyde to Statesville.....	33.00

*Feed eaten during preliminary period, October 15 to November 2, 1913, inclusive.*

To 1,004 pounds cotton-seed meal @ \$27.75 per ton.....	13.93
" 420 pounds cotton-seed hulls @ \$7.50 per ton.....	1.57
" 6,027 pounds corn silage @ \$3.50 per ton.....	10.55
" 1,458 pounds rye straw @ \$5.00 per ton.....	3.65

*Feed eaten during experimental period, November 3, 1913, to February 22, 1914, inclusive.*

To 20,016 pounds cotton-seed meal @ \$27.75 per ton.....	277.72
" 58,995 pounds cotton-seed hulls @ \$7.50 per ton.....	221.23

*Feed eaten after close of experiment, February 23 to 25, 1914, inclusive.*

To 112.5 pounds cotton-seed meal @ \$27.75 per ton.....	1.56
" 405 pounds cotton-seed hulls @ \$7.50 per ton.....	1.52
" 1,620 pounds corn silage @ \$3.50 per ton.....	2.84
" 720 pounds crab-grass hay @ \$10.00 per ton.....	3.60
" 25 pounds wheat bran* @ \$32.00 per ton.....	.40
" bedding material.....	40.00
" 200 hours labor @ 10c. per hour.....	20.00

Total expenditures.....	\$ 1,899.93
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## RECEIPTS:

By 24 steers, 25,540 pounds, @ \$7.50 per cwt.....	1,915.50
Total profit.....	15.57
Profit per steer.....	.64
By 92.63 tons manure @ \$2.50 per ton.....	231.57
Total profit, including manure.....	247.14
Average profit per steer, including manure.....	10.29

\*Fed through error.

## FINANCIAL STATEMENT.

Lot 2—24 STEERS, FED COTTON-SEED MEAL AND CORN SILAGE.

Corn Silage Valued at Various Prices Per Ton.	Valuation of Corn Silage Per Ton.		
	\$3.00.	\$3.50.	\$4.00.
<b>EXPENDITURES:</b>			
To 24 steers, 22,091.5 pounds, @ \$5.75 per cwt.....	\$1,270.26	\$1,270.26	\$ 1,270.26
“ freight on above—Clyde to Statesville.....	33.00	33.00	33.00
<i>Feed eaten during preliminary period, October 15 to November 2, 1913, inclusive.</i>			
To 1,004 pounds cotton-seed meal @ \$27.75 per ton.....	13.93	13.93	13.93
“ 420 pounds cotton-seed hulls @ \$7.50 per ton.....	1.57	1.57	1.57
“ 6,027 pounds corn silage.....	9.04	10.55	12.05
“ 1,458 pounds rye straw @ \$5.00 per ton.....	3.65	3.65	3.65
<i>Feed eaten during experimental period, November 3, 1913, to February 22, 1914, inclusive.</i>			
To 20,016 pounds cotton-seed meal @ \$27.75 per ton.....	277.72	277.72	277.72
“ 114,120 pounds corn silage.....	171.18	199.71	228.24
<i>Feed eaten after close of experiment, February 23 to 25, 1914, inclusive.</i>			
To 112.5 pounds cotton-seed meal @ \$27.75 per ton.....	1.56	1.56	1.56
“ 405 pounds cotton-seed hulls @ \$7.50 per ton.....	1.52	1.52	1.52
“ 1,620 pounds corn silage.....	2.43	2.84	3.24
“ 720 pounds crab-grass hay @ \$10.00 per ton.....	3.60	3.60	3.60
“ 25 pounds wheat bran* @ \$32.00 per ton.....	.40	.40	.40
“ bedding material.....	40.00	40.00	40.00
“ 200 hours labor @ 10c. per hour.....	20.00	20.00	20.00
Total expenditures.....	\$1,849.86	\$1,880.31	\$ 1,910.74
<b>RECEIPTS:</b>			
By 24 steers, 25,580 pounds, @ \$7.70 per cwt.....	1,969.66	1,969.66	1,969.66
Total profit.....	119.80	89.35	58.92
Profit per steer.....	4.99	3.72	2.45
By 92.63 tons manure @ \$2.50 per ton.....	231.57	231.57	231.57
Total profit, including manure.....	351.37	320.92	290.49
Average profit per steer, including manure.....	14.64	13.37	12.10
<i>Average Profit on 48 Steers.</i>			
Total profit.....	135.37	104.92	74.49
Average profit per steer.....	2.82	2.19	1.55
Total profit, including manure.....	598.51	568.06	537.63
Average profit per steer, including manure.....	12.47	11.84	11.20

\*Fed through error.









**THE BULLETIN**  
OF THE  
**NORTH CAROLINA**  
**DEPARTMENT OF AGRICULTURE**  
**RALEIGH**

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**Vol. 35, No. 9.**

**SEPTEMBER, 1914**

**Whole No. 200**

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Red Clover Field Overrun by Wild Carrots.

**REPORT OF SEED TESTS FOR 1914**

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**PUBLISHED MONTHLY AND SENT FREE TO CITIZENS ON APPLICATION**

Entered at the Postoffice at Raleigh, N. C., as second class matter,

February 7, 1901, under Act of June 6, 1900.

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\*Assigned by the Bureau of Soils, United States Department of Agriculture.

†Assigned by the Bureau of Animal Husbandry, United States Department of Agriculture.

‡In cooperation with Bureau of Plant Industry, United States Department of Agriculture.

## LETTER OF TRANSMITTAL.

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RALEIGH, August 1, 1914.

HON. W. A. GRAHAM,  
*Commissioner of Agriculture,*  
*Raleigh, N. C.*

SIR:—I have the honor to submit herewith the report on the recleaning, analysis, and germination of the agricultural and vegetable seed samples collected and analyzed in accordance with the North Carolina Pure Seed Act; also, samples submitted by interested individuals, from July 15, 1913, to July 15, 1914, and recommend its publication as the September BULLETIN of the Division of Agronomy and Botany of this Department.

Respectfully submitted,

J. L. BURGESS,  
*Agronomist and Botanist.*

Approved for printing:  
W. A. GRAHAM,  
*Commissioner of Agriculture.*

# REPORT OF THE DIVISION OF AGRONOMY AND BOTANY FOR 1914

By JAMES L. BURGESS, Agronomist and Botanist in Charge.

## GENERAL REMARKS.

According to the provisions of the North Carolina Pure Seed Act, seed samples have been collected and analyzed since the act went into effect, July 1, 1909. The present publication is the fourth report of seed tests made by this Department, and includes all samples received from July 15, 1913, to July 15, 1914. During that time 1,773 samples in all have been tested; total agricultural seed samples 955, samples from inspectors 727, samples from individuals 228. Total samples for purity was 872, total samples for germination was 948. Germination tests were made of 818 samples of vegetable seeds. Also 123 samples of tobacco seed were received and cleaned for farmers of the State.

The volume of work in the Seed Laboratory in the handling of agricultural and vegetable seeds, has almost doubled within the past year, as the following tables will show.

TABLE No. 1.  
TOTAL NUMBER OF SAMPLES OF AGRICULTURAL SEEDS RECEIVED.

	1913	1914
Alfalfa.....	10	28
Barley.....	3	3
Beans, Soja.....	1	4
Beans, Velvet.....	8	1
Grass, Kentucky Blue.....	19	34
Chufas.....	2	
Clover, Alsike.....	2	12
Clover, Burr.....	1	1
Clover, Crimson.....	66	131
Clover, Red.....	51	98
Clover, Sweet.....	1	3
Field Corn.....	73	28
Cow Peas.....	14	1
Meadow Fescue.....	1	2
Italian Rye Grass.....	1	7
Orchard Grass.....	9	51
Tall Meadow Oat Grass.....	2	14
German Millet.....	12	14
Pearl Millet.....	11	6

TABLE NO. 1—CONTINUED.

	1913	1914
Oats.....	142	233
Canada Field Peas.....	2	2
Rape.....	9	49
Red Top.....	8	37
Rye.....	53	64
Timothy.....	12	33
Winter Vetch.....	6	41
Wheat.....	6	26

TABLE No 2.

TOTAL NUMBER OF SAMPLES OF VEGETABLE SEEDS RECEIVED.

Wholesale Dealer	1913	1914
W. W. Barnard Co., Chicago, Ill.....	3	9
J. Bolgiano & Son, Baltimore, Md.....	3	2
Robert Buist Co., Philadelphia, Pa.....	14	63
Crosman Bros. Co., Rochester, N. Y.....	27	113
Diggs & Beadles, Richmond, Va.....	1	5
D. M. Ferry & Co., Detroit, Mich.....	64	233
Lake Shore Seed Co., Dunkirk, N. Y.....	30	95
D. Landreth Seed Co., Bristol, Pa.....	18	54
Leonard Seed Co., Chicago, Ill.....	2	27
L. L. May & Co., St. Paul, Minn.....	7	18
J. B. Rice Seed Co., Cambridge, N. Y.....	10	73
T. W. Wood & Sons, Richmond, Va.....	14	84

SEED SHOULD BE TESTED AND THE VALUE KNOWN BEFORE PURCHASING.

The wisdom of having seed tested and of knowing the actual cost and value of the seed to be planted may be illustrated by the following data. These samples were tested in the laboratory, and are fairly typical of the different grades of seed offered on the market at the same price.

TABLE No. 3.

Laboratory Number	Kind of Seed	Retail Price	Actual Cost	Actual Value
1388.....	Crimson Clover.....	\$0.15 per pound...	\$0.16 per pound...	95 per cent.
2232.....	Crimson Clover.....	.15 per pound...	1.30 per pound...	11 per cent.
1427.....	Red Clover..... (No Dodder.)	.20 per pound...	.21 per pound...	96 per cent.
1409.....	Red Clover..... (Dodder present.)	.20 per pound...	.30 per pound...	48 per cent.
2108.....	Orchard Grass.....	.20 per pound...	.22 per pound...	73 per cent.
2024.....	Orchard Grass.....	.20 per pound...	.56 per pound...	25 per cent.
1534.....	Redtop.....	.20 per pound...	.22 per pound...	87 per cent.
2157.....	Redtop.....	.20 per pound...	.32 per pound...	37 per cent.

#### WEED SEEDS.

The three kinds of weed seeds of most frequent occurrence in the principal kinds of agricultural seeds tested are given below, the one found most frequently being listed first:

*Alfalfa*—Buckhorn, Green Foxtail, Lamb's Quarters.

*Bluegrass, Kentucky*—Field Sorrel, Buckhorn, Large Mouse-ear Chickweed.

*Clover, Crimson*—Black or Hop Medic, Wild Mustard, Slender Foxtail.

*Clover Red*—Buckhorn, Curled Dock, Green Foxtail.

*Clover, White*—Field Sorrel, Black or Hop Medic, Large Mouse-ear Chickweed.

*Grass, Orchard*—Field Sorrel, Buckhorn, Cheat.

*Oats*—Cheat, Corn Cockle, Darnel.

*Redtop*—Yarrow, Rugel's Plantain, Woolly Panicum.

Out of 51 samples of Red Clover seed tested, Dodder was found to occur in 21 samples, and in no samples of Alfalfa out of 8 samples tested.

According to section 5 of the North Carolina Seed Act, the occurrence of the following weed seeds in agricultural seeds to be used for planting is considered unlawful: Wild Onion or Garlic (*Allium vineale* L. and *A. Canadense* L.), Wild Mustard (*Brassica arvensis* (L.) Ktz.), Couch-grass (*Agropyron repens* (L.) Beauv.) Canada Thistle (*Carduus arvensis* (L.) Robs.), Wild Oat (*Avena fatua* L.), Clover Dodder (*Cuscuta Epithymum* Murr), Corn Cockle (*Agrostemma Githago* L.), Cheat (*Bromus secalinus* L.), Dog Fennel (*Eupatorium capillifolium* (Lam.) Small.), Wild Carrot (*Daucus Carota* L.).

TABLE No. 4.

SHOWING THE FIFTY WEED SEEDS OF MOST COMMON OCCURRENCE,  
FOUND IN ALL OF THE SAMPLES TESTED FOR PURITY.

(872 Samples Examined.)

	Scientific Name	Common Name	Found in
1	<i>Rumex crispus</i> .....	Curled Dock.....	178 samples
2	<i>Rumex acetosella</i> .....	Field Sorrel.....	168 samples
3	<i>Medicago lupulina</i> .....	Black Medic.....	133 samples
4	<i>Plantago lanceolata</i> .....	Buckhorn.....	110 samples
5	<i>Plantago Rugelii</i> .....	Rugel's Plantain.....	102 samples
6	<i>Bromus secalinus</i> .....	Chess.....	99 samples
7	<i>Chaetochloa viridis</i> .....	Green Foxtail.....	98 samples
8	<i>Alopecurus agrestis</i> .....	Slender Foxtail.....	95 samples
9	<i>Brassica arvensis</i> .....	Wild Mustard.....	78 samples
10	<i>Chaetochloa glauca</i> .....	Yellow Foxtail.....	66 samples
11	<i>Lychnis alba</i> .....	White Campion.....	59 samples
12	<i>Potentilla Monspeliensis</i> .....	Rough Cinquefoil.....	56 samples
13	<i>Geranium dissectum</i> .....	Cut-leaved Cranesbill.....	53 samples
14	<i>Chenopodium album</i> .....	Lamb's Quarters.....	49 samples
15	<i>Cerastium vulgatum</i> .....	Larger Mouse-ear Chickweed.....	49 samples
16	<i>Carex</i> spp.....	Sedges.....	46 samples
17	<i>Achillea Millefolium</i> .....	Yarrow.....	44 samples
18	<i>Sherardia arvensis</i> .....	Blue Field-madder.....	42 samples
19	<i>Vicia hirsuta</i> .....	Hairy Tare.....	41 samples
20	<i>Holcus lanatus</i> .....	Velvet Grass.....	40 samples
21	<i>Agrostemma Githago</i> .....	Corn Cockle.....	39 samples
22	<i>Juncus</i> spp.....	Rushes.....	38 samples
23	<i>Galium Aparine</i> .....	Cleavers.....	37 samples
24	<i>Lolium temulentum</i> .....	Darnel.....	37 samples
25	<i>Polygonum Convolvulus</i> .....	Black Bindweed.....	32 samples
26	<i>Ambrosia artemisiaefolia</i> .....	Ragweed.....	31 samples
27	<i>Bromus hordeaceus</i> .....	Soft Chess.....	31 samples
28	<i>Bromus racemosus</i> .....	Upright Chess.....	29 samples
29	<i>Festuca myuros</i> .....	Rat's-tail Fescue Grass.....	29 samples
30	<i>Lepidium apetalum</i> .....	Apetalous Peppergrass.....	28 samples
31	<i>Polygonum Persicaria</i> .....	Lady's Thumb.....	28 samples
32	<i>Lepidium virginicum</i> .....	Wild Peppergrass.....	26 samples
33	<i>Koellia flexuosa</i> .....	Mountain Mint.....	26 samples
34	<i>Syntherisma sanguinalis</i> .....	Large Crab-grass.....	24 samples
35	<i>Silene antirrhina</i> .....	Sleepy Catch-fly.....	23 samples
36	<i>Vicia sativa</i> .....	Spring Vetch.....	23 samples

TABLE NO. 4—CONTINUED.

	Scientific Name	Common Name	Found in
37	<i>Carex cephalophora</i> .....	Oval-headed Sedge.....	22 samples
38	<i>Panicum capillare</i> .....	Witch-grass.....	22 samples
39	<i>Valerianella</i> sp.....	Corn Salad.....	21 samples
40	<i>Syntherisma linearis</i> .....	Small Crab-grass.....	20 samples
41	<i>Veronica arvensis</i> .....	Corn Speedwell.....	20 samples
42	<i>Bursa Bursa-pastoris</i> .....	Shepherd's Purse.....	19 samples
43	<i>Daucus carota</i> .....	Wild Carrot.....	18 samples
44	<i>Panicularia nervata</i> .....	Nerved Manna-grass.....	18 samples
45	<i>Plantago aristata</i> .....	Large-bracted Plantain.....	16 samples
46	<i>Conringia orientalis</i> .....	Hare's-ear Mustard.....	16 samples
47	<i>Prunella vulgaris</i> .....	Heal-all.....	16 samples
48	<i>Allium vineale</i> .....	Wild Onion.....	15 samples
49	<i>Lithospermum arvense</i> .....	Corn Gromwell.....	15 samples
50	<i>Anthyllis Vulneraria</i> .....	Kidney Vetch.....	15 samples

## CLEANING TOBACCO SEED.

Two years ago this Division began a new line of work, that of cleaning tobacco seed for farmers of the State. Most gratifying reports have been received from persons for whom seed was cleaned. The following shows the trend of opinion among the tobacco farmers in regard to this new line of work:

"The tobacco seed I had cleaned by the Department of Agriculture last year I gave to one hundred and twenty-five farmers, and find them all pleased with the seed. I want to say that I find a great difference in the results where seeds are cleaned.

"First. I get stronger plants on beds, and have no small, inferior plants.

"Second. The tobacco lives better; not having to replant, grows evenly, not having any late, inferior tobacco to contend with.

"Third. It matures uniformly, making the housing of the crop easier.

"Fourth. I get a better grade of tobacco, heavier and more uniform.

"Fifth. Better plants, regular growth, uniform maturity, heavier crops, and better prices I find to be the result of cleaned seed, with which I am much pleased. I am sending you today my seed for this year to be cleaned."

From a very small beginning this work has grown till during the past year we recleaned and returned to the tobacco farmers enough seed to plant over 43,000 acres of tobacco. The farmers are thus appreciating the importance of clean seed for the tobacco crop as well as for other crops.

The planting of clean seed of high vitality is of such importance that it is hoped the tobacco farmers of the State will take advantage of the opportunity the Department offers and have all of their seed cleaned. This work can be done more efficiently by the Department than by the farmers, as the Seed Laboratory has special apparatus for doing this work. Several times the quantity of seed desired for sowing should be

sent to insure a sufficient quantity of cleaned seed. The seed should be sent some time before it is wanted. The Department makes no charge for cleaning tobacco seed.

### HOW TO SEND SEED SAMPLES FOR TESTING.

Of the smaller seed, such as the grasses and clovers, about three or four tablespoonfuls is a sufficient amount to send for testing. Of the larger seeds, as corn and oats, about a cupful is necessary. The following information should accompany all samples: Name and address of wholesale and retail dealer, retail price, and name and address of sender. Samples should be securely wrapped and addressed to

THE NORTH CAROLINA SEED LABORATORY,  
DEPARTMENT OF AGRICULTURE,  
RALEIGH, N. C.

### TABLE No. 5.

#### TOBACCO SEEDS RECLEANED FOR THE FARMERS OF THE STATE.

Laboratory Number	Name and Address of Sender	Amount of Recleaned Seed Returned
5136	J. A. Anderson, R. F. D. No. 6, Oxford, N. C.....	185 c. c.
5165	A. D. Atkinson, Kenly, N. C.....	110 c. c.
5184	W. E. Atkinson, Kenly, N. C.....	90 c. c.
5108	J. B. Atwater, Chapel Hill, N. C.....	200 c. c.
5199	W. R. Badgett, Pilot Mountain, N. C.....	95 c. c.
5118	E. T. Barkley, Elm City, N. C.....	365 c. c.
5186	J. D. Barnett, R. F. D. No. 8, Burlington, N. C.....	140 c. c.
5183	H. E. Beamer, R. F. D. No. 1, Rush, N. C.....	23 c. c.
5151	T. A. Blackwelder, R. F. D. No. 2, Cana, N. C.....	160 c. c.
5126	A. W. Blalock, Roxboro, N. C.....	130 c. c.
5124	E. R. Blalock, Roxboro, N. C.....	520 c. c.
5123	W. R. Blalock, Roxboro, N. C.....	460 c. c.
5096	D. C. Blue, White Plains, N. C.....	125 c. c.
5092	G. J. Blue, White Plains, N. C.....	120 c. c.
5104	E. L. Boswell, Union Ridge, N. C.....	950 c. c.
5196	Simeon Bowling, Durham, N. C.....	80 c. c.
5164	S. H. Brantley, Spring Hope, N. C.....	205 c. c.
5101	C. A. Bray, Greensboro, N. C.....	50 c. c.
5160	John L. Bray, Jonesville, N. C.....	100 c. c.
5205	W. H. Bray, Jonesville, N. C.....	55 c. c.
5170	Z. B. Britt, Garner, N. C.....	177 c. c.

TABLE NO. 5—CONTINUED.

Laboratory Number	Name and Address of Sender	Amount of Recleaned Seed Returned
5125	Frank Brooks, Roxboro, N. C.....	260 c. c.
5187	H. T. Brown, R. F. D. No. 2, Sandy Ridge, N. C.....	45 c. c.
5204	P. G. Brown, R. F. D. No. 2, Cana, N. C.....	20 c. c.
5198	S. Browning, R. F. D. No. 1, West Durham, N. C.....	260 c. c.
5192	A. H. Bryant, R. F. D. No. 1, Jonesville, N. C.....	95 c. c.
5207	J. O. Burgh, Smith, N. C.....	95 c. c.
5194	Elias Carr, Raleigh, N. C.....	90 c. c.
5209	Elias Carr, Raleigh, N. C.....	105 c. c.
5171	W. J. Cantrell, R. F. D. No. 2, Burlington, N. C.....	130 c. c.
5181	J. W. Chandler, Ruffin, N. C.....	85 c. c.
5193	C. R. Christian, R. F. D. No. 1, Westfield, N. C.....	75 c. c.
5140	S. P. Christian, Westfield, N. C.....	580 c. c.
5197	S. P. Christian, Westfield, N. C.....	180 c. c.
5175	T. W. Collins, Elkin, N. C.....	130 c. c.
5142	W. A. Connell, Warren Plains, N. C.....	290 c. c.
5201	Scott H. Cox, R. F. D. No. 2, Pinnacle, N. C.....	75 c. c.
5100	Eddie Cozart, Stems, N. C.....	600 c. c.
5097	J. H. Craddock, R. F. D. No. 1, Wentworth, N. C.....	92 c. c.
5093	J. M. Crews, R. F. D. No. 3, Kernersville, N. C.....	100 c. c.
5185	J. M. Davis, R. F. D. No. 2, Boonville, N. C.....	62 c. c.
5111	H. C. Denny, R. F. D. No. 3, Pinnacle, N. C.....	240 c. c.
5098	A. F. Dickinson, R. F. D. No. 3, Oxford, N. C.....	56 c. c.
5119	J. I. Eason, R. F. D. No. 1, Stantonsburg, N. C.....	210 c. c.
5200	Lee Essic, Pilot Mountain, N. C.....	20 c. c.
5191	C. L. Essick, R. F. D. No. 2, Pinnacle, N. C.....	85 c. c.
5190	J. D. Essick, R. F. D. No. 2, Pinnacle, N. C.....	65 c. c.
5128	Farmers Exchange, Stoneville, N. C.....	180 c. c.
5129	.....do.....	125 c. c.
5088	E. M. Fearington, Riggsbee, N. C.....	100 c. c.
5179	Nathan Fields, Princeton, N. C.....	185 c. c.
5090	II. A. Finch, R. F. D. No. 1, Kittrell, N. C.....	150 c. c.
5169	J. W. Finch, R. F. D. No. 2, Henderson, N. C.....	325 c. c.
5103	J. H. Foushee, R. F. D. No. 1, Roxboro, N. C.....	840 c. c.
5133	.....do.....	275 c. c.
5087	Andrew J. Garm, R. F. D. No. 2, Sandy Ridge, N. C.....	75 c. c.
5182	J. A. Giles, Durham, N. C.....	98 c. c.
5235	P. H. Gill, R. F. D. No. 4, Henderson, N. C.....	420 c. c.
5156	S. M. Gordon, Pinnacle, N. C.....	55 c. c.
5115	Jas. M. Gray, R. F. D. No. 3, Durham, N. C.....	165 c. c.

TABLE No. 5—CONTINUED.

Laboratory Number	Name and Address of Sender	Amount of Recleaned Seed Returned
5172	O. B. Gullie, R. F. D. No. 7, Raleigh, N. C.....	90 c. c.
5141	L. D. Hale, R. F. D. No. 1, Danbury, N. C.....	98 c. c.
5148	F. M. Halland, R. F. D. No. 2, Kernersville, N. C.....	15 c. c.
5149	C. T. Hamm, Tobaccoville, N. C.....	135 c. c.
5094	J. W. Hampton, Clemmons, N. C.....	100 c. c.
5162	do.....	145 c. c.
5113	A. A. Harris, Roxboro, N. C.....	475 c. c.
5112	A. J. Harris, Roxboro, N. C.....	380 c. c.
5114	G. E. Harris, Roxboro, N. C.....	12249 c. c.
5143	M. D. Harris, Durham, N. C.....	105 c. c.
5195	C. F. Helsabeck, Rural Hall, N. C.....	215 c. c.
5180	H. O. Helsabeck, Rural Hall, N. C.....	200 c. c.
5167	J. M. Hester, Belew Creek, N. C.....	100 c. c.
5173	J. L. Hill, R. F. D. No. 2, Mocksville, N. C.....	85 c. c.
5147	Home Savings Bank, Greensboro, N. C.....	17693 c. c.
5203	R. A. Hooper, Corbett, N. C.....	35 c. c.
5203	D. R. Hopkins, Brown Summit, N. C.....	85 c. c.
5127	J. T. Horton, R. F. D. No. 1, Chapel Hill, N. C.....	225 c. c.
5139	J. L. Jackson, R. F. D. No. 4, Mt. Airy, N. C.....	110 c. c.
5095	J. M. Jackson, R. F. D. No. 1, Stokesdale, N. C.....	47 c. c.
5163	J. I. Larimore, R. F. D. No. 3, Winston-Salem, N. C.....	45 c. c.
5120	C. L. Lasater, R. F. D. No. 4, Apex, N. C.....	230 c. c.
5137	do.....	85 c. c.
5146	A. B. Lassiter, Smithfield, N. C.....	335 c. c.
5158	H. L. Leonard, R. F. D. No. 3, Lexington, N. C.....	80 c. c.
5132	J. C. McCulloch, R. F. D. No. 8, Burlington, N. C.....	70 c. c.
5152	H. C. Martin, Stoneville, N. C.....	575 c. c.
5102	J. V. Mitchell, Stoneville, N. C.....	530 c. c.
5176	E. W. Neel, R. F. D. No. 2, Princeton, N. C.....	52 c. c.
5161	J. P. Pace, R. F. D. No. 1, Mebane, N. C.....	35 c. c.
5106	Julie Pace, R. F. D. No. 1, Watson, N. C.....	88 c. c.
5159	N. L. Pace, R. F. D. No. 1, Mebane, N. C.....	50 c. c.
5121	W. R. Parks, White Plains, N. C.....	125 c. c.
5138	E. H. Parrish, Rougemont, N. C.....	65 c. c.
5144	do.....	63 c. c.
5134	L. P. Pell, Pilot Mountain, N. C.....	165 c. c.
5122	M. A. Phelps, Clemmons, N. C.....	140 c. c.
5145	A. P. Pickett, R. F. D. No. 1, Durham, N. C.....	243 c. c.
5154	Alfred Plummer, Middleburg, N. C.....	250 c. c.

TABLE NO. 5—CONTINUED.

Laboratory Number	Name and Address of Sender	Amount of Recleaned Seed Returned
5202	W. P. Ray, R. F. D. No. 1, Smith, N. C.....	57 c. c.
5163	J. W. Reece, Mt. Airy, N. C.....	100 c. c.
5177	J. E. Roberts, Stoneville, N. C.....	165 c. c.
5206	W. L. Rudd, Jericho, N. C.....	80 c. c.
5157	C. F. Shield, R. F. D. No. 1, Kernersville, N. C.....	75 c. c.
5189	H. D. Shields, R. F. D. No. 1, Kernersville, N. C.....	90 c. c.
5130	W. Ed. Shugart, Yadkinville, N. C.....	190 c. c.
1566	J. R. Smith, Altamahaw, N. C.....	92 c. c.
5131	J. S. Smith, R. F. D. No. 1, White Plains, N. C.....	115 c. c.
5105	J. W. Smithwick, Manson, N. C.....	445 c. c.
5109	R. W. Snow, Crutchfield, N. C.....	170 c. c.
5188	S. J. E. Summers, R. F. D. No. 2, Altamahaw, N. C.....	265 c. c.
5091	Pervis Tilley, Bahama, N. C.....	38108 c. c.
5155	Wm. Thomas, Hightowers, N. C.....	110 c. c.
5174	O. B. Umstead, Stagville, N. C.....	210 c. c.
5110	L. R. Wellons, Raleigh, N. C.....	205 c. c.
5116	W. T. White, R. F. D. No. 1, Rusk, N. C.....	260 c. c.
5153	Wm. M. Whitefield, R. F. D. No. 3, Hurdle Mills, N. C.....	135 c. c.
5117	J. C. Whitsell, R. F. D. No. 4, Burlington, N. C.....	390 c. c.
5178	E. W. Wilkins, R. F. D. No. 2, Burlington, N. C.....	75 c. c.
5150	Jno. H. Wilkins, R. F. D. No. 2, Burlington, N. C.....	290 c. c.
5107	J. E. Williams, R. F. D. No. 1, Chapel Hill, N. C.....	275 c. c.
5089	J. H. Williams, R. F. D. No. 1, Chapel Hill, N. C.....	100 c. c.
5099	J. P. Wilson, R. F. D. No. 2, Madison, N. C.....	132 c. c.
	Total.....	88270 c. c.

TABLE No. 6.

AGRICULTURAL SEEDS FROM THE FOLLOWING 43 WHOLESALE DEALERS  
WERE COLLECTED FROM THE NORTH CAROLINA MARKET AND  
TESTED.

<i>Dealer.</i>	<i>Location.</i>
Adams Grain and Provision Co.....	Asheville, N. C.
Adams Grain and Provision Co.....	Nashville, Tenn.
Adams Grain and Provision Co.....	Norfolk, Va.
Adams Grain and Provision Co.....	Richmond, Va.
Barnard, W. W., & Co.....	Chicago, Ill.
Beveridge, S. T., & Co.....	Richmond, Va.
Bolgiano, J., & Son.....	Baltimore, Md.
Buffington, J. J., & Co.....	Baltimore, Md.
Buist, Robert, Seed Co.....	Philadelphia, Pa.
Carter, Venable & Co.....	Richmond, Va.
Corbett Co., The .....	Wilmington, N. C.
Diggs & Beadles .....	Richmond, Va.
Dixon & Etheridge .....	Goldsboro, N. C.
Gore, D. L., & Co.....	Wilmington, N. C.
Griffith & Turner Co.....	Baltimore, Md.
Hackney, Broyles & Lackey Co.....	Knoxville, Tenn.
Hall & Pearsall .....	Wilmington, N. C.
Hardin, Hamilton & Lewman.....	Louisville, Ky.
Harsh Grain Co.....	Nashville, Tenn.
Hickory Seed Co.....	Hickory, N. C.
Hines, E. G.....	Goldsboro, N. C.
Landreth, D., Seed Co.....	Bristol, Pa.
Leonard Seed Co.....	Chicago, Ill.
Lewis & Chambers .....	Louisville, Ky.
Logan & Co. ....	Nashville, Tenn.
Louisville Seed Co.....	Louisville, Ky.
Mayo Milling Co.....	Richmond, Va.
Meadows, J. A. ....	New Bern, N. C.
Moose, George .....	Newton, N. C.
National Seed Co.....	Louisville, Ky.
Reid, D. P., & Bro.....	Norfolk, Va.
Rice, J. B., Seed Co.....	Cambridge, N. Y.
Richardson, W. F., Jr., & Co.....	Richmond, Va.
Roper & Co.....	Petersburg, Va.
Savage, N. R., & Son.....	Richmond, Va.
Scarlett, Wm. G., & Co.....	Baltimore, Md.
Simpson, W. A., & Co.....	Baltimore, Md.
Slate Seed Co.....	South Boston, Va.
Smith Seed & Feed Co.....	Danville, Va.
Southern Distributing Co.....	Norfolk, Va.
Tate, W. R.....	Nashville, Tenn.
Tennessee Grain Co.....	Nashville, Tenn.
Wood, T. W., & Sons.....	Richmond, Va.

TABLE No. 7.

ADDRESSES AND NAMES OF 288 RETAIL DEALERS IN 106 TOWNS, FROM WHOM AGRICULTURAL SEED SAMPLES WERE COLLECTED AND TESTED.

<i>Location.</i>	<i>Dealer.</i>
Ahoskie .....	S. E. Dilday.
Ahoskie .....	J. T. Williams & Bro.
Ashboro .....	McCrary Hardware Co.
Ashboro .....	J. T. Turner.
Asheville .....	Grant's Pharmacy.
Asheville .....	T. S. Morrison & Co.
Asheville .....	Slayden, Fakes & Co.
Asheville .....	L. R. Stricker.
Ayden .....	R. C. Cannon & Sons.
Ayden .....	H. G. Mumford.
Benson .....	J. H. Boone & Son.
Benson .....	W. N. Stewart.
Brevard .....	W. S. Ashworth & Sons.
Brevard .....	Brevard Hardware Co.
Bryson City .....	J. H. Ditmore.
Burgaw .....	C. Harrell & Son.
Burlington .....	Coble-Bradshaw Co.
Burlington .....	Holt & May.
Burlington .....	Jos. A. Iseley, Bros. & Co.
Cameron .....	Farmers Union Supply Co.
Cameron .....	M. McL. McKeithen.
Canton .....	J. C. Cole.
Canton .....	G. L. Hampton.
Chadbourn .....	Chadbourn Grocery Co.
Chadbourn .....	Lonlenon & Lonlenon.
Charlotte .....	Bridgers & Co.
Charlotte .....	Davidson & Wolfe.
Charlotte .....	Farmers Supply Co.
Charlotte .....	W. J. Fite.
Charlotte .....	Johnston Bros.
Clinton .....	Aman Grocery Co.
Clinton .....	J. G. Hobbs.
Clinton .....	J. C. Petersen.
Clinton .....	B. F. Powell.
Concord .....	H. M. Blackwelder.
Concord .....	Cline & Moose.
Concord .....	W. J. Glass.
Concord .....	H. L. Parks & Co.
Concord .....	White, Morrison, Flowe Co.
Dunn .....	Hood & Grantham.
Dunn .....	Johnson Bros.
Dunn .....	James E. Jordan.
Dunn .....	J. L. Thompson.
Durham .....	Byrd & Upchurch.
Durham .....	Carlton-Hackney Drug Co.
Durham .....	Carpenter Bros.
Durham .....	Five Points Drug Co.
Durham .....	Haywood & Boone.
Durham .....	C. E. King & Sons.
Durham .....	J. T. Rogers & Co.
Edenton .....	H. C. Prevatt.
Elizabeth City .....	T. P. Nash.
Elizabeth City .....	Spence & Hollowell Co.
Elizabeth City .....	W. S. White & Co.
Elm City .....	E. O. McGowan.
Elm City .....	R. S. Wells.
Enfield .....	Bellamy & Co.

<i>Dealer.</i>	<i>Location.</i>
Enfield .....	Curtis-Parson Co.
Enfield .....	Curtis, Pierce & Co.
Enfield .....	Lawrence Bros.
Enfield .....	B. D. Mann.
Fairmont .....	A. J. Floyd.
Farmville .....	R. L. Davis & Bros.
Farmville .....	T. L. & W. J. Turnage Co.
Fayetteville .....	A. S. Huske.
Fayetteville .....	A. E. Rankin & Co.
Forest City .....	Florence Mills.
Franklinton .....	Franklin Grocery Co.
Franklinton .....	McGhee-Joyner Co.
Franklinton .....	Whedbee & Morris.
Franklinton .....	C. S. Williams.
Fremont .....	Geo. D. Best & Son.
Fremont .....	Hooks, Bellame & Co.
Fremont .....	Z. M. L. Peacock.
Fremont .....	Yelverton & Bros.
Gastonia .....	Gaston Seed & Provision Co.
Gastonia .....	M. T. Parham & Co.
Goldsboro .....	M. J. Best & Sons.
Goldsboro .....	H. L. Bizzell.
Goldsboro .....	Geo. E. Daniels.
Goldsboro .....	Deans & Moye Co.
Goldsboro .....	Z. M. L. Jeffreys.
Goldsboro .....	Thompson & Sons.
Goldsboro .....	T. N. Waters & Bro.
Goldsboro .....	Williams Drug Store.
Goldsboro .....	W. V. Williams.
Greensboro .....	Carolina Warehouse.
Greensboro .....	J. F. Fulton.
Greensboro .....	R. G. Hiatt & Co.
Greensboro .....	C. Scott & Co.
Greenville .....	J. B. Johnston.
Greenville .....	J. R. & J. G. Moyes.
Greenville .....	L. M. Savage.
Gulf .....	W. S. Russell.
Halifax .....	N. L. Stedman & Co.
Henderson .....	Beacom Supply Co.
Henderson .....	E. G. Davis & Son Co.
Henderson .....	Parham Supply Co.
Henderson .....	W. W. Parker.
Henderson .....	Geo. A. Rose & Co.
Henderson .....	Thomas Bros.
Henderson .....	White-Hight Co.
Hendersonville .....	Byers Bros.
Hendersonville .....	Farmers Hardware & Supply Co.
Hendersonville .....	J. O. Houston & Sons.
Hendersonville .....	F. V. Hunter.
Hendersonville .....	Hunter's Pharmacy.
Hickory .....	Boyd Feed Co.
Hickory .....	City Feed Co.
Hickory .....	Hickory Seed Co.
High Point .....	Beeson Hardware Co.
High Point .....	High Point Hardware Co.
Hillsboro .....	Geo. A. Durham.
Hillsboro .....	H. L. Parrish.
Hillsboro .....	H. W. & J. C. Webb.
Kenly .....	G. G. Edgerton & Son.
Kenly .....	J. T. Egerton.
Kings Mountain .....	Kiser & Mauney.
Kings Mountain .....	W. A. Mauney & Bro.

<i>Dealer.</i>	<i>Location.</i>
Kings Mountain .....	Patterson Grocery Co.
Kinston .....	Ray Dawson.
Kinston .....	Henry Dunn.
Kinston .....	J. E. Hood & Co.
Kinston .....	T. W. Mewborn & Co.
Kinston .....	Temple Drug Co.
LaGrange .....	Isbel & Peele.
LaGrange .....	E. S. Mewborn.
LaGrange .....	T. W. Pace.
Laurinburg .....	John F. McNair.
Lenoir .....	Harrison & Co.
Lexington .....	Robert L. Leonard.
Lexington .....	Lexington Hardware Co.
Lexington .....	S. L. Owen & Co.
Lincolnton .....	Lowing & Costner.
Lincolnton .....	J. H. Rudisill & Co.
Littleton .....	Eugene Johnson.
Littleton .....	Littleton Feed & Grocery Co.
Littleton .....	Littleton Grocery Co.
Littleton .....	J. H. Newsom.
Littleton .....	S. J. Stallings.
Louisburg .....	Allen Bros. Co.
Louisburg .....	L. P. Hicks.
Louisburg .....	McKinne Bros.
Lucama .....	Lucas & Bass Co.
Lucama .....	W. J. Newsom & Bro.
Lumberton .....	L. H. Caldwell.
Lumberton .....	M. W. Floyd.
Magnolia .....	George Edwards.
Magnolia .....	Roy Hill Co.
Magnolia .....	J. C. Horne.
Magnolia .....	Theo. Middleton.
Marion .....	J. D. Blanton.
Marion .....	Gaston & Tate.
Marshall .....	W. J. Gudger & Son.
Marshall .....	T. N. James & Co.
Marshall .....	Madison County Farmers Union.
Marshall .....	A. L. Plemmons.
Marshall .....	Tweed & Franklin.
Maxton .....	J. W. Carter.
Maysville .....	A. C. Foster.
Mocksville .....	J. T. Angell.
Mocksville .....	Walker's Bargain House.
Monroe .....	F. B. Ashcraft.
Mooreville .....	Harris & McNeely.
Mooreville .....	W. M. Neel & Co.
Morganton .....	W. A. Leslie.
Morganton .....	Shuping & Poteat.
Mount Airy .....	W. E. Merritt & Co.
Mount Airy .....	Mount Airy Feed Store.
Mount Airy .....	F. L. Smith Hardware Co.
Mount Gilead .....	Bruton & Co.
Mount Gilead .....	Farmers Supply Co.
Mount Gilead .....	Thomas H. Graham.
Mount Gilead .....	Frank McAuley.
Mount Gilead .....	J. A. McAuley.
Mount Gilead .....	Mount Gilead Store Co.
Mount Olive .....	Y. H. Knowles.
Mount Olive .....	J. M. Lewis.
Mount Olive .....	E. G. Martin, Son & Co.
Mount Olive .....	Mount Olive Grocery & Hardware Co.
Murphy .....	R. H. Hyatt & Co.

<i>Dealer.</i>	<i>Location.</i>
Nashville .....	Arrington-Bissett Co.
Nashville .....	Cockerell & Williams Co.
Nashville .....	King Coöperative Co.
Nashville .....	Nash Supply Co.
Nashville .....	Planters Supply Co.
Nashville .....	J. D. Winstead & Son.
New Bern .....	J. F. Clarke.
New Bern .....	C. B. Hill.
New Bern .....	C. L. Spencer.
Newton .....	George Moose.
Norwood .....	Hart Drug Co.
Oxford .....	Breedlove & McFarland.
Oxford .....	J. D. Brooks.
Oxford .....	J. W. & D. S. Fuller.
Oxford .....	Horner Bros.
Oxford .....	Lyon-Winston Co.
Oxford .....	R. S. Montague.
Oxford .....	Winston-Long Co.
Parmelee .....	J. C. Bryan & Co.
Parmelee .....	Gray & Roebuck.
Plymouth .....	A. L. Owens.
Raeform .....	N. S. Blue & Co.
Reidsville .....	J. H. Burton.
Reidsville .....	Harris & Hubbard.
Reidsville .....	Hazell & Mims.
Reidsville .....	W. P. Ware.
Robersonville .....	Roberson-Holiday Co.
Robersonville .....	J. H. Roberson & Co.
Robersonville .....	W. A. Roberson & Co.
Rockingham .....	McRae Grocery Co.
Rocky Mount .....	Dozier & Griffin.
Rocky Mount .....	George S. Edwards.
Rocky Mount .....	H. C. Joyner.
Rocky Mount .....	T. L. Warsley.
Rocky Mount .....	W. T. Williford.
Roxboro .....	Garrett & Stanfield Co.
Roxboro .....	C. H. Hunter.
Roxboro .....	Sergeant & Clayton.
Roxboro .....	Hugh Woods.
Rural Hall .....	E. L. Kiser & Co.
Rutherfordton .....	Thompson & Watkins.
Rutherfordton .....	Williams & Erwin.
Salisbury .....	W. L. Klutz.
Salisbury .....	M. C. Rufty.
Salisbury .....	Union Warehouse.
Sanford .....	Lee, Stone & Co.
Sanford .....	Wilkins, Ricks & Co.
Scotland Neck .....	Edwards & Co.
Scotland Neck .....	W. T. Hancock & Co.
Scotland Neck .....	M. Hoffman & Bro.
Selma .....	C. E. Kornegay.
Selma .....	Selma Supply Co.
Shelby .....	R. E. Campbell.
Shelby .....	J. N. Dellinger.
Shelby .....	H. E. Kendall.
Shelby .....	W. B. Palmer's Sons.
Shelby .....	Paul Webb.
Siler City .....	The Hardware Store.
Smithfield .....	Austin-Stephenson Co.
Smithfield .....	Carter-Underwood Co.

<i>Dealer.</i>	<i>Location.</i>
Smithfield .....	W. M. Sanders.
Spring Hope .....	N. B. Finch & Co.
Spring Hope .....	W. H. Griffin & Co.
Spring Hope .....	T. C. May & Son.
Statesville .....	Miller-McLean Supply Co.
Statesville .....	J. E. Sloop.
Sylva .....	B. H. Cathey & Co.
Sylva .....	Sylva Cash Store.
Sylva .....	Sylva Supply Co.
Tarboro .....	W. S. Clarke & Sons.
Tarboro .....	R. E. L. Cook.
Tarboro .....	R. B. Peters Grocery Co.
Taylorsville .....	J. B. Barnes.
Thomasville .....	Crutchfield Hardware Co.
Thomasville .....	Thomasville Drug Co.
Troy .....	G. W. Allen & Sons.
Troy .....	A. W. E. Capel.
Troy .....	Saunders & Co.
Wadesboro .....	Parsons Drug Co.
Wallace .....	Duplin Grocery Co.
Wallace .....	Hall Mercantile Co.
Wallace .....	Wallace Grocery Co.
Warrenton .....	Burroughs Grocery Co.
Warsaw .....	J. B. Cox.
Warsaw .....	Hobbs & Russ.
Washington .....	Walter Credle & Co.
Washington .....	Hardy Drug Co.
Waxhaw .....	Wolfe Drug Co.
Waynesville .....	Chautauqua Drug Co.
Weldon .....	L. J. Moore.
Weldon .....	W. T. Parker.
Whitakers .....	Whitaker's Pharmacy.
Wilkesboro .....	Miller Grocery Co.
Wilkesboro .....	N. B. Smyhey.
Wilkesboro, North .....	C. Call.
Williamston .....	Anderson-Crawford Co.
Williamston .....	Harrison Bros. & Co.
Wilson .....	Hadley-Harriss Co.
Wilson .....	Doane Herring.
Wilson .....	Wilson Drug Co.
Wilson .....	Wilson Grocery Co.
Windsor .....	J. P. Freeman.
Winston-Salem .....	J. J. Adams' Sons Co.
Winston-Salem .....	T. M. Benton.
Winston-Salem .....	Farmers Cash and Feed Store.
Winston-Salem .....	Farmers Union Agency Co.
Winston-Salem .....	B. A. Poindexter.

TABLE No. 8.

VEGETABLE SEEDS FROM THE FOLLOWING 16 WHOLESALE DEALERS WERE  
COLLECTED FROM THE NORTH CAROLINA MARKET AND TESTED.

<i>Dealer.</i>	<i>Location.</i>
Barnard, W. W., & Co.....	Chicago, Ill.
Bolgiano, J., & Son.....	Baltimore, Md.
Buist, Robert, Co.....	Philadelphia, Pa.
Burpee, W. Atlee, & Co.....	Philadelphia, Pa.
Clarke, Everett B., Seed Co.....	Milford, Conn.
Crosman Bros. Co.....	Rochester, N. Y.
Diggs & Beadles .....	Richmond, Va.
Ferry, D. M., & Co.....	Detroit, Mich.
Griffith & Turner .....	Baltimore, Md.
Lake Shore Seed Co.....	Dunkirk, N. Y.
Landreth, D., Seed Co.....	Bristol, Pa.
Leonard Seed Co.....	Chicago, Ill.
May, L. L., & Co.....	St. Paul, Minn.
Rice, J. B., Seed Co.....	Cambridge, N. Y.
Wood, Stubbs & Co.....	Louisville, Ky.
Wood, T. W., & Sons.....	Richmond, Va.

TABLE No. 9.

ADDRESSES AND NAMES OF 218 RETAIL DEALERS IN 97 TOWNS FROM  
WHOM VEGETABLE SEED SAMPLES WERE COLLECTED AND TESTED.

<i>Location.</i>	<i>Dealer.</i>
Aberdeen .....	Standard Store Co.
Ahoskie .....	S. J. Dilday.
Albemarle .....	E. C. Kirk.
Albemarle .....	Morrow Bros. & Heath Co.
Albemarle .....	Shankle-Snuggs Co.
Asheville .....	Grant's Pharmacy.
Beaufort .....	Beaufort Drug Co.
Beaufort .....	Potter Bros.
Beaufort .....	M. R. Springler.
Belhaven .....	W. H. Bowen & Son.
Benson .....	W. F. Smith.
Boardman .....	Buthers Lumber Co.
Brevard .....	Brevard Hardware Co.
Burgaw .....	C. Harrell & Son.
Burgaw .....	Singestory Drug Co.
Canton .....	W. G. Cole.
Chadbourn .....	Brown Mercantile Co.
Charlotte .....	Charlotte Drug Co.
Charlotte .....	W. L. Hond & Co.
Charlotte .....	Reese & Alexander, Inc.
Charlotte .....	Woodall & Sheppard.
Clinton .....	D. M. Patrick & Co.
Clinton .....	J. C. Peterson.
Clinton .....	B. F. Powell.
Clinton .....	H. S. Southerland.
Cofield .....	Hill Bros.
Concord .....	Cabarrus Drug Co.
Concord .....	Cook & Harris.
Concord .....	Davis Drug Co.
Concord .....	Dove-Bost Co.
Concord .....	Gibson Drug Co.
Davidson .....	Armour Bros. & Thompson.
Dover .....	W. A. Wilson.

<i>Location.</i>	<i>Dealer.</i>
Dunn .....	N. A. Bell & Co.
Dunn .....	Hood & Grantham.
Dunn .....	Robinson Bros.
Edenton .....	W. R. Brothers.
Edenton .....	W. A. Leggett.
Edenton .....	J. A. Mitchener.
Edenton .....	Mitchener's Pharmacy.
Edenton .....	W. S. White.
Elizabeth City .....	Spence & Hollowell.
Elizabeth City .....	W. S. White & Co.
Elm City .....	J. L. Bailey.
Elm City .....	J. W. Sharp.
Enfield .....	Harrison & Hill Drug Co.
Farmville .....	T. L. & W. J. Turnage Co.
Fayetteville .....	A. J. Cook & Co.
Fayetteville .....	J. B. Fields.
Fayetteville .....	A. S. Huske.
Franklinton .....	Franklin Grocery Co.
Franklinton .....	T. L. Joyner.
Gastonia .....	Adams Drug Co.
Gastonia .....	Gaston Seed & Provision Co.
Gastonia .....	Kennedy's Drug Co.
Gastonia .....	Torrence Drug Co.
Goldsboro .....	M. J. Best & Son.
Goldsboro .....	George E. Daniels.
Goldsboro .....	Deans & Moye Co.
Goldsboro .....	Z. M. L. Jeffreys.
Goldsboro .....	B. G. Thompson & Son.
Goldsboro .....	T. N. Waters & Bro.
Greensboro .....	J. F. Fulton.
Greensboro .....	C. Scott & Co.
Greenville .....	J. B. Johnston.
Greenville .....	J. L. Stashey.
Greenville .....	John L. Wooten Drug Co.
Halifax .....	Ferguson Drug Co.
Hamlet .....	Hamlet Pharmacy.
Hamlet .....	Earle Morrow Drug Store.
Hamlet .....	E. L. Rhodes.
Henderson .....	W. W. Parker.
Henderson .....	Thomas Bros.
Hendersonville .....	Bradsher's Pharmacy.
Hendersonville .....	T. B. Carson.
Hertford .....	W. S. Blanchard & Son.
Hertford .....	Divers & Roper.
Hertford .....	Watson & Winslow.
High Point .....	S. F. Brown & Co.
High Point .....	Mann Drug Co.
Jackson .....	E. S. Barrett & Co.
Jackson .....	Taylor & Cowan.
Jacksonville .....	G. T. Walton & Co.
Kings Mountain .....	Barnes-Finger Drug Co.
Kings Mountain .....	Kiser & Mauney.
Kinston .....	Henry Dunn.
Kinston .....	J. E. Hood & Co.
Kinston .....	Lenoir Drug Co.
Kinston .....	E. B. Marston Drug Co.
Kinston .....	Temple Drug Co.
LaGrange .....	E. Barwick.
LaGrange .....	E. S. Mewborn.
LaGrange .....	E. E. Rouse & Co.
Laurinburg .....	J. T. Fields.
Laurinburg .....	R. G. Stone.

<i>Location.</i>	<i>Dealer.</i>
Lincolnton .....	W. C. Asbury.
Lincolnton .....	Lawnings Drug Store.
Lincolnton .....	Lowing & Costner.
Lincolnton .....	J. H. Rudisill & Co.
Littleton .....	Herbert Smith.
Louisburg .....	Aycock Drug Co.
Louisburg .....	Beasley-Austin Drug Co.
Louisburg .....	F. R. Pleasants.
Madison .....	Madison Grocery Co.
Magnolia .....	J. C. Horne.
Magnolia .....	F. D. Scott & Co.
Marion .....	Davis Pharmacy.
Maxton .....	E. L. Burns.
Maxton .....	A. L. Jones.
Monroe .....	English Drug Co.
Monroe .....	Latham & Richardson.
Monroe .....	C. N. Simpson, Jr.
Monroe .....	Dr. S. J. Welsh & Son.
Morehead City .....	J. B. Morton.
Morganton .....	L. A. Kincaid.
Morganton .....	Leslie Drug Store.
Mount Airy .....	W. F. Midkiff.
Mount Airy .....	Mount Airy Feed Store.
Mount Airy .....	The Peoples Drug Store.
Mount Airy .....	I. W. West Drug Co.
Mount Gilead .....	Bruton & Co.
Mount Olive .....	M. R. Jennett.
Mount Olive .....	Y. H. Knowles.
Mount Olive .....	J. M. Lewis.
Mount Olive .....	Martin & Price Co.
Mount Olive .....	Mount Olive Grocery and Hardware Co.
Mount Olive .....	M. W. Pope.
Nashville .....	Nash Supply Co.
Nashville .....	J. D. Winstead & Son.
New Bern .....	J. F. Clarke.
New Bern .....	B. B. Davenport.
New Bern .....	F. S. Duffy.
New Bern .....	C. L. Spencer.
New Bern .....	S. W. Willis.
Newton .....	Clarence Clapp.
Norwood .....	Hart Drug Co.
Oriental .....	W. J. Morgan.
Oxford .....	Hamilton Drug Co.
Oxford .....	J. T. Sizemore.
Oxford .....	L. Thomas.
Plymouth .....	Alexander & Blount.
Plymouth .....	Tom L. Smith.
Plymouth .....	Henry L. Spruill.
Polloksville .....	H. A. Chadwick.
Proctorville .....	Barnes Bros.
Raeford .....	Raeford Hardware Co.
Red Springs .....	Red Springs Drug Co.
Red Springs .....	John J. Steward Co.
Red Springs .....	John J. Thrower Co.
Reidsville .....	W. S. Allen.
Reidsville .....	Fetzer & Tucker.
Reidsville .....	Harris & Hubbard.
Roanoke Rapids .....	Wells Dillery.
Robersonville .....	Roberson, Cory & Co.
Robersonville .....	J. H. Roberson & Co.
Rockingham .....	E. N. Covington & Co.
Rockingham .....	Eagle Pharmacy.

<i>Location.</i>	<i>Dealer.</i>
Rockingham .....	L. G. Fox.
Rockingham .....	E. D. Whitelock.
Rocky Mount .....	Fitzgerald Drug Co.
Rocky Mount .....	H. C. Joyner.
Rocky Mount .....	Kyser's Drug Store.
Rocky Mount .....	C. R. L. Matthews
Rocky Mount .....	May & Gorman.
Roseboro .....	D. W. Tart.
Salisbury .....	J. W. McPherson & Co
Salisbury .....	M. C. Rufty.
Scotland Neck .....	G. T. Whitehead & Co.
Selma .....	Selma Drug Co.
Selma .....	Selma Supply Co.
Shelby .....	H. E. Kendall.
Smithfield .....	W. M. Sanders.
Star .....	Mitchell & Barrow.
Tarboro .....	R. E. L. Cook.
Tarboro .....	Robinson-Ruffin Co.
Tarboro .....	Tarboro Grocery Co.
Vanceboro .....	H. L. Arnold.
Wadesboro .....	Fox & Lyon.
Wadesboro .....	Parson Drug Co.
Wadesboro .....	V. F. Tarlton.
Wallace .....	Murray & Armstrong.
Walnut Cove .....	Golden Rule Drug Store.
Warrenton .....	Burroughs Grocery Co.
Warrenton .....	Hunter Drug Co.
Warsaw .....	W. D. Thomas & Co.
Washington .....	Blount Pharmacy.
Washington .....	W. A. & J. G. Blount.
Washington .....	A. J. Cox & Co.
Washington .....	Walter Credle & Co.
Washington .....	Hardy Drug Co.
Washington .....	E. K. Willis.
Washington .....	Worthy & Etheridge.
Waxhaw .....	Harris Bros.
Waynesville .....	Chautauqua Drug Co.
Waynesville .....	Miller Bros.
Weldon .....	E. Clarke.
Wilkesboro .....	Miller Grocery Co.
Williamston .....	Theo. Roberson & Co.
Williamston .....	Saunders & Fowden.
Wilmington .....	R. R. Bellamy.
Wilmington .....	J. H. Hardin.
Wilmington .....	W. J. Kirkman & Co.
Wilson .....	Doane Herring.
Wilson .....	Ruffin-High Co.
Wilson .....	J. D. Williams.
Wilson .....	Wilson Drug Co.
Windsor .....	J. J. Madre & Bro.
Winston-Salem .....	J. J. Adams' Sons Co.
Winston-Salem .....	J. Enra Cox.
Winston-Salem .....	Eford Bros.
Winston-Salem .....	Farmers Trade House Co.
Winston-Salem .....	J. G. Messick.
Winston-Salem .....	E. W. O'Hanlon & Co.
Winston-Salem .....	Owens Drug Co.
Winston-Salem .....	P. A. Thompson.
Winton .....	W. P. Shaw, Jr., & Bro.
Youngsville .....	E. T. Alford.
Youngsville .....	Winston-Blanks Drug Co.

TABLE No. 10.

VEGETABLE SEED SAMPLES WERE COLLECTED IN THE FOLLOWING 60 COUNTIES.

Anson.	Halifax.	Pender.
Beaufort	Harnett.	Perquimans.
Bertie.	Haywood.	Pitt.
Buncombe.	Henderson.	Richmond.
Burke.	Hertford.	Robeson.
Cabarrus.	Johnston.	Rockingham.
Carteret.	Jones.	Rowan.
Catawba.	Lenoir.	Sampson.
Chowan.	Lincoln.	Scotland.
Cleveland.	McDowell.	Stanly.
Columbus.	Martin.	Stokes.
Craven.	Mecklenburg.	Surry.
Cumberland.	Montgomery.	Transylvania.
Duplin.	Moore.	Union.
Edgecombe.	Nash.	Vance.
Forsyth.	New Hanover.	Warren.
Franklin.	Northampton.	Washington.
Gaston.	Onslow.	Wayne.
Granville	Pamlico.	Wilkes.
Guilford.	Pasquotank.	Wilson.

TABLE No. 11.

AGRICULTURAL SEED SAMPLES WERE COLLECTED IN THE FOLLOWING 70 COUNTIES.

Alamance.	Granville.	Pender.
Alexander.	Guilford.	Person.
Anson.	Halifax.	Pitt.
Beaufort.	Harnett.	Randolph.
Buncombe.	Haywood.	Richmond.
Burke.	Henderson.	Robeson.
Cabarrus.	Hertford.	Rockingham.
Caldwell.	Iredell.	Rowan.
Catawba.	Jackson.	Rutherford.
Chatham.	Johnston.	Sampson.
Cherokee.	Jones.	Scotland.
Chowan.	Lee.	Stanly.
Cleveland.	Lenoir.	Surry.
Columbus.	Lincoln.	Swain.
Craven.	McDowell.	Transylvania.
Cumberland.	Madison.	Union.
Davidson.	Martin.	Vance.
Davie.	Mecklenburg.	Warren.
Duplin.	Montgomery.	Washington.
Durham.	Moore.	Wayne.
Edgecombe.	Nash.	Wilkes.
Forsyth.	Orange.	Wilson.
Franklin.	Pasquotank.	
Gaston.		

TABLE XII.—RESULTS OF TESTS OF 28 KINDS OF AGRICULTURAL SEEDS, 727 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913 TO JULY 15, 1914.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Per Cent of Pure Seed	Per Cent of Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
6079	ALFALFA.....	J. Bolgiano & Son, Baltimore, Md.....	Hickory Seed Co., Hickory, N. C.....	99.22	.25	.53	86.5
6082	do.....	Diggs & Beadles, Richmond, Va.....	Farmers Cash and Feed Store, Winston-Salem, N. C.....	99.48	.16	.36	91.0
2971	do.....	do.....	C. E. King & Sons, Durham, N. C.....	*94.15	.33	5.52	*41.0
6078	do.....	Hardin, Hamilton & Lewman, Louisv., Ky.....	Gaston & Tate, Marion, N. C.....	99.36	.28	.36	91.5
6308	do.....	N. R. Savage & Son, Richmond, Va.....	George Moose, Newton, N. C.....	99.41	.28	.31	91.0
6155	do.....	T. W. Wood & Sons, Richmond, Va.....	A. W. E. Capel, Troy, N. C.....	99.59	.37	.04	86.0
6206	do.....	do.....	Cline & Moose, Concord, N. C.....	98.38	.57	1.05	80.0
6081	do.....	do.....	Farmers Union Agency Co., Winston-Salem, N. C.....	98.92	.35	.73	178.0
6279	do.....	do.....	J. F. Fulton, Greensboro, N. C.....	99.70	.28	.02	88.0
6239	do.....	do.....	A. S. Huske, Fayetteville, N. C.....	99.63	.23	.14	95.0
6399	do.....	do.....	H. E. Kendall, Shelby, N. C.....	99.54	.27	.19	93.0
6080	do.....	do.....	W. A. Leslie, Morganton, N. C.....	99.60	.35	.05	88.5
6157	do.....	do.....	W. S. Russell, Gulf, N. C.....	98.94	.41	.65	177.0
6156	do.....	do.....	Saunders & Company, Troy, N. C.....	96.89	2.72	.39	159.5
6107	Barley.....	S. T. Beveridge & Co., Richmond, Va.....	C. Scott & Co., Greensboro, N. C.....	97.96	1.42	.62	99.5
6108	( <i>Cheat.</i> ) do.....	Wm. G. Scarlett & Co., Baltimore, Md.....	Farmers Union Agency Winston-Salem, N. C.....	99.37	.63	.00	99.5
2909	do.....	T. W. Wood & Sons, Richmond, Va.....	E. O. McGowan, Elm City, N. C.....	98.30	1.22	.48	98.0
6541	BLUEGRASS, ( <i>Cheat.</i> ) do.....	S. T. Beveridge & Co., Richmond, Va.....	J. H. Ditmore, Bryson City, N. C.....	*65.19	34.24	.57	61.0

6501	do	Robert Buist Co., Philadelphia, Pa.	Boyd Feed Co., Hickory, N. C.	83.40	16.23	.37	57.0
6089	do	Carter, Venable & Co., Richmond, Va.	Harrison & Company, Lenoir, N. C.	81.67	18.14	.19	135.5
2969	do	Diggs & Beadles, Richmond, Va.	C. E. King & Sons, Durham, N. C.	*78.23	21.10	.67	56.0
6161	do	Hardin, Hamilton & Lewman, Louisv., Ky.	Davidson & Wolfe, Charlotte, N. C.	85.17	14.71	.09	55.0
6092	do	do	Gaston & Tate, Marion, N. C.	*74.77	25.14	.09	52.5
6091	do	do	C. Scott & Co., Greensboro, N. C.	80.27	19.44	.29	61.5
6542	do	Lewis & Chambers, Louisville, Ky.	G. L. Hampton, Canton, N. C.	81.43	17.43	1.14	126.0
6389	do	N. R. Savage & Son, Richmond, Va.	Gaston Seed & Provision Co., Gastonia, N. C.	85.69	14.02	.29	52.0
6275	do	do	Hazel & Mines, Reidsville, N. C.	86.42	12.81	.77	141.0
6276	do	do	W. E. Merritt & Co., Mount Airy, N. C.	90.04	9.58	.38	56.0
6390	do	do	George Moose, Newton, N. C.	88.97	10.35	.68	50.0
6499	do	Wm. G. Searlett & Co., Baltimore, Md.	Shuping & Potat, Morganton, N. C.	84.37	15.14	.49	143.0
6293	do	T. W. Wood & Sons, Richmond, Va.	Cline & Moose, Concord, N. C.	80.65	17.52	1.83	62.5
6237	do	do	do	79.61	20.03	.36	44.5
6238	do	do	Farmers Supply Co., Charlotte, N. C.	*73.34	15.64	11.02	54.0
6202	do	do	Gaston Seed & Prov. Co., Gastonia, N. C.	81.10	16.89	2.01	60.5
6391	do	do	H. E. Kendall, Shelby, N. C.	82.25	1.46	1.15	138.5
6090	do	do	S. L. Owen & Co., Lexington, N. C.	*79.30	18.81	1.89	64.0
6160	do	do	Wilkins, Riels & Co., Sanford, N. C.	80.63	17.32	2.05	65.5
6500	do	do	Slayden, Fakes & Co., Asheville, N. C.	*69.39	30.14	.47	52.5
2996	CANE	do	A. S. Huske, Fayetteville, N. C.	98.74	.93	.33	162.5
2997	do	do	do	98.76	1.07	.17	120.0
6093	CLOVER, ALSIKE	S. T. Beveridge & Co., Richmond, Va.	Harrison & Co., Lenoir, N. C.	89.20	1.83	8.97	167.3
6127	do	N. R. Savage & Son, Richmond, Va.	Farmers Supply Co., Charlotte, N. C.	96.30	.24	3.46	77.3
6280	do	do	J. F. Fulton, Greensboro, N. C.	95.65	.25	4.10	82.3
6126	do	T. W. Wood & Sons, Richmond, Va.	A. W. E. Capel, Troy, N. C.	98.98	.63	.39	156.8

TABLE XII.—RESULTS OF TESTS OF 28 KINDS OF AGRICULTURAL SEEDS, 727 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913 TO JULY 15, 1914—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Per Cent of Pure Seed	Per Cent of Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
6400	CL VER, ALSIKE.....	T. W. Wood & Sons, Richmond, Va.....	Gaston Seed & Prov. Co., Gastonia, N. C.....	99.55	.25	.20	171.0
6094	do.....	do.....	W. A. Leslie, Morganton, N. C.....	97.20	2.27	.53	162.3
6104	CLOVER, BUR.....	Diggs & Beadles, Richmond, Va.....	Farmers Cash & Feed Store, Winston-Salem, N. C.....	94.74	3.96	1.30	32.5
2973	CLOVER, CRIMSON.....	S. T. Beveridge & Co., Richmond, Va.....	Anderson, Crawford Co., Williamston, N. C.....	*90.42	2.52	1.06	99.0
6116	do.....	do.....	Farmers Supply Co., Charlotte, N. C.....	*96.06	1.45	1.89	95.5
6118	do.....	do.....	Farmers Union Supply Co., Cameron, N. C.....	97.97	1.62	.41	93.0
6115	do.....	do.....	W. J. Fite, Charlotte, N. C.....	*96.88	1.28	1.84	94.5
2880	do.....	do.....	Franklin Grocery Co., Franklinton, N. C.....	*97.36	2.11	.53	94.5
2879	do.....	do.....	Z. M. L. Jeffreys, Goldsboro, N. C.....	*97.04	1.61	1.35	169.5
6117	do.....	do.....	Johnston Brothers, Charlotte, N. C.....	97.54	1.71	.73	88.0
2914	do.....	do.....	H. L. Parrish, Hillsboro, N. C.....	99.33	.49	.18	91.0
6017	do.....	do.....	Paul Webb, Shelby, N. C.....	97.97	1.66	.37	95.5
2893	do.....	J. Bolgiano & Son, Baltimore, Md.....	Dozier & Griffin, Rocky Mount, N. C.....	*96.31	2.65	1.04	173.0
6111	do.....	do.....	Hart Drug Co., Norwood, N. C.....	98.53	1.08	.39	88.5
2912	do.....	do.....	Holt & May, Burlington, N. C.....	97.99	.74	1.27	91.5
2913	do.....	do.....	H. W. and J. C. Webb, Hillsboro, N. C.....	*97.40	2.58	.02	182.0
6114	do.....	John J. Buffington & Co., Baltimore, Md.....	Davidson & Wolfe, Charlotte, N. C.....	97.73	1.54	.73	91.5
6233	do.....	do.....	do.....	98.06	1.27	.67	91.0
2932	do.....	Carter, Venable & Co., Richmond, Va.....	Coble-Bradshaw Co., Burlington, N. C.....	*96.92	1.48	1.60	93.0
2933	do.....	do.....	do.....	*97.06	2.58	.36	95.5

2878	do ( <i>Wild mustard, Wild Onion.</i> )	do	Deans & Moye Co., Goldsboro, N. C.	*97.30	2.22	.48	177.5
2928	do	do	Geo. A. Durham, Hillsboro, N. C.	97.74	1.97	.29	93.0
2929	do	do	do	*96.92	2.60	.48	181.5
6016	do	do	Harrison & Co., Lenoir, N. C.	*97.03	2.34	.63	97.0
6110	do	do	M. McL. McKeithen, Cameron, N. C.	*97.45	1.56	.99	96.5
2891	do	do	Parham Supply Co., Henderson, N. C.	*96.58	2.68	.64	182.5
2930	do ( <i>Wild mustard, Corn coelite.</i> )	do	Winston-Long Co., Oxford, N. C.	*94.82	4.19	.99	11.0
2931	do	do	do	98.40	1.37	.23	91.5
2892	do ( <i>Wild mustard.</i> )	Diggs & Beadles, Richmond, Va.	The Beacom Supply Co., Henderson, N. C.	*96.27	2.42	1.31	94.5
6019	do	do	T. M. Benton, Winston-Salem, N. C.	99.61	12.00	.27	183.0
6297	do	do	do	97.60	1.99	.41	92.5
6170	do	do	Cline & Moose, Concord, N. C.	*97.22	1.41	1.37	91.5
6171	do	do	do	*95.94	2.42	1.64	91.0
2974	do	do	A. S. Huske, Fayetteville, N. C.	*97.04	1.25	1.71	98.0
2975	do	do	A. S. Huske, Fayetteville, N. C.	*96.57	2.58	.85	98.0
6018	do ( <i>Wild mustard.</i> )	do	Robt. L. Leonard, Lexington, N. C.	*97.32	2.27	.41	98.0
2915	do	do	Geo. A. Rose, Henderson, N. C.	98.02	1.27	.71	98.0
2877	do	Roper & Co., Petersburg, Va.	Allen Bros. Co., Louisville, N. C.	99.73	-----	.27	154.5
2926	do	do	Breedlove & McFarland, Oxford, N. C.	*96.87	2.22	.91	91.5
2927	do ( <i>Wild mustard.</i> )	do	do	98.10	1.82	.98	90.0
2925	do	do	L. P. Hicks, Louisville, N. C.	*97.28	2.01	.71	95.0
2882	do	do	E. Johnson, Littleton, N. C.	98.08	1.15	.77	97.0
2923	do	do	McChes-Joyner Co., Franklinton, N. C.	*96.91	2.21	.88	88.5
2883	do ( <i>Wild mustard.</i> )	do	S. J. Stallings, Littleton, N. C.	97.81	1.32	.87	95.5
2922	do	do	Whedbee & Morris, Franklinton, N. C.	98.18	1.18	.64	86.5
2924	do ( <i>Wild mustard.</i> )	do	White-Hight Co., Henderson, N. C.	*95.98	3.71	.31	173.5

TABLE XII.—RESULTS OF TESTS OF 28 KINDS OF AGRICULTURAL SEEDS, 727 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913 TO JULY 15, 1914—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Pure Cent of	Per Cent of Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
2881	Clover, Cramson..... (Wild mustard.)	Roper & Co., Petersburg, Va.....	C. S. Williams, Franklinton, N. C.....	98.08	1.56	.36	93.0
2918	do.....	N. R. Savage & Son, Richmond, Va.....	J. D. Brooks, Oxford, N. C.....	*96.87	2.48	.63	85.0
6504	do..... (Wild mustard.)	do.....	City Feed Co., Hickory, N. C.....	98.29	.71	1.00	95.5
2921	do..... (Wild mustard.)	do.....	Holt & May, Burlington, N. C.....	*97.42	1.84	.74	90.0
2949	do..... (Wild mustard.)	do.....	Horner Bros., Oxford, N. C.....	98.48	1.15	.37	87.0
6113	do..... (Wild mustard.)	do.....	Johnston Bros., Charlotte, N. C.....	*97.45	1.76	.79	93.0
6011	do..... (Wild mustard.)	do.....	Lexington Hardware Co., Lexington, N. C.....	*96.69	2.37	.46	98.5
2876	do.....	do.....	McKinne Bros. Co., Louisville, N. C.....	98.40	1.42	.18	86.0
6013	do..... (Wild mustard.)	do.....	W. E. Merritt & Co., Mount Airy, N. C.....	98.81	.96	.23	90.5
6012	do..... (Wild mustard.)	do.....	Mount Airy Feed Store, Mount Airy, N. C.....	*95.13	4.47	.36	97.0
6112	do..... (Wild mustard.)	do.....	W. M. Sanders, Smithfield, N. C.....	*97.34	2.35	.31	86.5
2920	do..... (Wild mustard.)	do.....	Hugh Woods, Roxboro, N. C.....	*96.91	2.55	.54	84.5
2916	do..... (Wild mustard.)	Slate Seed Co., South Boston, Va.....	Sergeant & Clayton, Roxboro, N. C.....	98.08	1.69	.23	88.5
2917	do.....	do.....	Hugh Woods, Roxboro, N. C.....	*96.97	1.89	1.14	88.0
6015	do.....	Smith Seed & Feed Co., Danville, Va.....	J. H. Burton, Reidsville, N. C.....	98.79	.76	.45	98.5
6014	do.....	do.....	Harris & Hubbard, Reidsville, N. C.....	*96.24	3.47	.29	98.5
6120	do.....	T. W. Wood & Sons, Richmond, Va.....	G. W. Allen & Son, Troy, N. C.....	98.69	.94	.37	95.0
6000	do..... (Wild mustard.)	do.....	Beeson Hardware Co., High Point, N. C.....	*96.46	1.77	1.77	96.0
6001	do..... (Wild mustard.)	do.....	do.....	*96.92	2.64	.41	97.0

2938	do	Byrd & Upehurch, Durham, N. C.	*96.93	2.18	.91	96.0
6003	(Wild mustard.)	R. E. Campbell, Shelby, N. C.	97.63	1.58	.79	96.0
6121	do	A. W. E. Capel, Troy, N. C.	97.71	.71	1.58	96.5
2937	do	Carlton-Hackney Drug Co., Durham, N. C.	97.57	2.06	.37	95.5
2939	do	Carpenter Bros., Durham, N. C.	98.23	1.46	.31	97.5
6002	do	Crutchfield Hardware Co., Thomasville, N. C.	98.05	1.42	.53	92.0
2886	do	Curtis, Parson Co., Enfield, N. C.	*96.74	2.40	.86	86.5
6008	do	Farmers Cash & Feed Store, Winston-Salem, N. C.	97.62	1.49	.89	97.0
6123	do	Farmers Supply Co., Mount Gilead, N. C.	98.47	1.05	.48	97.5
2935	(Wild mustard.)	Five Points Drug Co., Durham, N. C.	*97.17	2.55	.28	84.5
2941	do	J. W. & D. S. Fuller, Oxford, N. C.	*96.17	3.06	.77	86.5
6124	do	Thomas H. Graham, Mount Gilead, N. C.	98.90	.64	.46	93.0
2976	do	Hardy Drug Co., Washington, N. C.	98.06	1.01	.93	93.5
6397	do	Harris & McNeely, Morrisville, N. C.	*95.21	3.84	.95	84.5
2936	do	Haywood & Boone, Durham, N. C.	98.26	1.37	.37	90.5
6005	do	Hazel & Mims, Reidsville, N. C.	*96.70	2.93	.37	98.0
6006	do	R. G. Hiatt & Co., Greensboro, N. C.	*97.09	2.17	.76	92.5
2999	(Wild mustard.)	High Point Hardware Co., High Point, N. C.	*96.19	2.84	.97	180.5
2934	do	Jos. A. Iseley, Bros. & Co., Burlington, N. C.	97.94	1.85	.21	93.5
6543	do	J. N. James & Co., Marshall, N. C.	*97.00	2.01	.99	89.5
6004	(Wild mustard.)	H. E. Kendall, Shelby, N. C.	99.28	.66	.06	96.0
6166	do	Kiser & Mauney, Kings Mountain, N. C.	98.22	1.17	.61	94.5
6010	do	Lexington Hardware Co., Lexington, N. C.	98.36	.91	.73	93.0
2884	(Wild mustard.)	Littleton Grocery Co., Littleton, N. C.	*96.07	2.95	.98	169.0

TABLE XII.—RESULTS OF TESTS OF 28 KINDS OF AGRICULTURAL SEEDS, 727 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913 TO JULY 15, 1914—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Pure Seed of Per Cent of	Inert Matter Per Cent of	Foreign Seed Per Cent of	Per Cent of Germination
2977	CLOVER, CRIMSON.....	T. W. Wood & Sons, Richmond, Va.....	Lucas & Bass Co., Lucama, N. C.....	98.01	1.70	.29	92.0
2888	do..... (Wild mustard.)	do.....	E. O. McGowan, Elm City, N. C.....	99.10	.76	.14	93.0
2887	do.....	do.....	B. D. Maun, Enfield, N. C.....	*95.62	2.49	1.89	93.0
6167	do..... (Wild mustard.)	do.....	W. A. Mauney & Bro., Kings Mountain, N. C.	*97.30	1.86	.84	98.5
6396	do.....	do.....	Miller-McLean Supply Co., Statesville, N. C.	97.94	1.57	.49	93.0
6210	do.....	do.....	W. M. Neel & Co., Mooresville, N. C.	*95.51	2.41	2.08	91.5
2942	do..... (Wild mustard.)	do.....	J. H. Newson, Littleton, N. C.	*96.82	2.71	.47	174.5
6009	do.....	do.....	S. L. Owen & Co., Lexington, N. C.	*97.46	1.68	.86	93.5
6164	do.....	do.....	M. T. Parham, Gastonia, N. C.	*96.53	.71	2.76	99.5
6165	do.....	do.....	do.....	97.75	1.62	.63	93.0
2890	do..... (Wild mustard.)	do.....	Parham Supply Co., Henderson, N. C.	*96.88	2.87	.25	183.0
2885	do.....	do.....	W. T. Parker, Weldon, N. C.	*95.45	3.35	1.20	97.0
2940	do.....	do.....	W. W. Parker, Henderson, N. C.	*96.66	.59	.75	93.5
6168	do..... (Wild mustard.)	do.....	Patterson Grocery Co., Kings Mtn., N. C.	*97.18	1.76	1.06	94.5
6119	do.....	do.....	W. S. Russell, Gulf, N. C.	*97.18	.73	2.09	91.0
6122	do.....	do.....	Saunders & Co., Troy, N. C.	98.89	.78	.33	93.0
6007	do.....	do.....	F. L. Smith Hardware Co., Mount Airy, N. C.	*96.67	2.22	1.11	93.0
6211	do.....	do.....	N. B. Smyhey, Wilkesboro, N. C.	97.70	1.51	.79	91.0
2889	do..... (Wild mustard.)	do.....	Thomas Bros., Henderson, N. C.	*97.26	2.31	.43	178.0

6169	do	do	White-Morrison-Flowe Co., Concord, N. C.	98.81	.94	.25	88.5
6125	do	do	Wilkins, Ricks Co., Sanford, N. C.	*96.11	3.33	.56	89.5
6020	do	Imported seed	Hickory Seed Co., Hickory, N. C.	*95.55	1.55	2.90	93.0
6573	Clover, JAPAN	T. W. Wood & Sons, Richmond, Va.	A. S. Huske, Fayetteville, N. C.	90.87	1.74	7.39	48.0
6388	Clover, RED	S. T. Beveridge & Co., Richmond, Va.	J. J. Adams & Sons Co., Winston-Salem, N. C.	99.60	.20	.20	85.0
2992	do	do	Anderson Crawford & Co., Williamston, N. C.	99.50	.48	.02	91.5
6467	do	do	Boyd Feed Co., Hickory, N. C.	97.84	1.36	.80	87.5
6525	do	do	J. H. Ditmore, Bryson City, N. C.	99.37	.30	.33	91.5
6128	do	do	Farmers Supply Co., Charlotte, N. C.	99.67	.21	.12	83.5
6370	do	do	Lowing & Costner, Lincolnton, N. C.	97.66	1.23	1.11	89.5
6129	do	do	Mt. Gilead Store Co., Mt. Gilead, N. C.	98.94	.45	.61	91.5
6524	do	J. Bolgiano & Son, Baltimore, Md.	Chautauqua Drug Co., Waynesville, N. C.	93.38	.82	.80	94.
2960	(Dodder.)	do	H. W. & J. C. Webb, Hillsboro, N. C.	93.03	.64	.33	140.5
6465	(Wild carrot.)	J. J. Buffington & Co., Baltimore, Md.	J. D. Blanton, Marion, N. C.	97.87	.90	1.23	96.0
6466	(Wild carrot.)	do	do	97.70	1.63	.67	93.5
6351	(Wild carrot.)	do	T. P. Nash, Elizabeth City, N. C.	97.93	1.56	.51	177.5
2963	do	Carter, Venable & Co., Richmond, Va.	C. H. Hunter, Roxboro, N. C.	94.73	1.13	4.14	79.5
6291	(Dodder.)	Diggs & Beadles, Richmond, Va.	T. M. Benton, Winston-Salem, N. C.	96.22	1.29	2.49	79.5
2991	(Dodder.)	do	A. S. Huske, Fayetteville, N. C.	99.01	.76	.23	80.5
2959	do	do	C. E. King & Sons, Durham, N. C.	93.63	6.07	.30	80.5
6038	(Wild carrot.)	do	Thomasville Drug Co., Thomasville, N. C.	93.27	.71	1.02	82.5
6526	(Dodder.)	do	R. H. Hiatt, Murphy, N. C.	97.96	.47	1.57	97.0
6036	do	Hackney, Broyles & Lackey Co., Knoxville, Tenn.	City Feed Co., Hickory, N. C.	94.38	2.11	3.51	83.0
6520	(Wild mustard.)	do	Hardin, Hamilton & Lewman, Louisiv., Ky.	94.23	1.65	4.12	90.5
6521	do	do	W. J. Gudger & Son, Marshall, N. C.	96.30	2.14	1.56	88.0

TABLE XII.—RESULTS OF TESTS OF 28 KINDS OF AGRICULTURAL SEDSE, 727 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913 TO JULY 15, 1914—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Per Cent of Pure Seed	Per Cent of Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
6208	CLOVER, RED.	Hardin, Hamilton & Lewman, Louisville, Ky.	W. M. Neel & Co., Mooresville, N. C.	99.80	.12	.08	75.0
6209	do	do	do	99.63	.37		84.5
6522	do	Lewis & Chambers, Louisville, Ky.	G. L. Hampton, Canton, N. C.	99.47	.31	.22	94.0
6523	do	do	do	98.82	.37	.81	92.0
6518	do	Louisville Seed Co., Louisville, Ky.	B. H. Cathey & Co., Sylva, N. C.	96.96	1.16	1.88	88.5
6519	do	do	do	93.22	.44	1.34	92.5
6037	do	do	Hickory Seed Co., Hickory, N. C.	89.97	4.52	5.51	84.0
6043	do (Wild mustard.)	N. R. Savage & Son, Richmond, Va.	C. Call, N. Wilkesboro, N. C.	93.34	1.27	.39	88.5
6044	do	do	do	98.70	.63	.67	83.0
6292	do	do	do	99.00	+.43	.57	97.0
6234	do	do	Davidson & Wolfe, Charlotte, N. C.	99.02	.54	.44	93.5
6040	do	do	Harris & Hubbard, Reidsville, N. C.	99.51	.22	.27	88.5
6041	do	do	Hazel & Mims, Reidsville, N. C.	99.35	.33	.32	92.5
6042	do	do	do	99.26	.39	.35	89.5
6262	do	do	do	99.08	.14	.18	92.0
6039	do	do	Lexington Hardware Co., Lexington, N. C.	99.74	.06	.20	83.5
6373	do	do	Miller Grocery Co., Wilkesboro, N. C.	99.02	.55	.43	97.0
6371	do	do	George Moose, Newton, N. C.	99.65	.16	.19	92.5
6372	do (Wild carrot.)	do	do	99.12	.44	.41	96.5
6263	do	do	Mt. Airy Feed Store, Mt. Airy, N. C.	98.90	.63	.47	92.5

6264	do	do	do	98.87	.73	.40	95.0
6265	do	do	H. L. Parks & Co., Concord, N. C.	99.17	.65	.18	93.5
6269	do	W. G. Scarlett & Co., Baltimore, Md.	E. L. Kiser & Co., Rural Hall, N. C.	98.87	.92	.21	96.0
6375	do	do	W. M. Neel & Co., Mooresville, N. C.	98.74	.99	.27	97.0
6374	(Wild carrot.)	do	J. H. Rudisill & Co., Lincolnton, N. C.	99.42	.23	.35	89.0
6468	do	do	Shuping & Poteat, Morganton, N. C.	98.25	1.50	.25	96.5
6236	do	T. W. Wood & Sons, Richmond, Va.	F. B. Ashcraft, Monroe, N. C.	98.84	.66	.50	90.0
6366	do	do	J. B. Barnes, Fayetteville, N. C.	99.67	.17	.16	95.0
6268	do	do	Bruton & Co., Mt. Gilead, N. C.	99.70	.24	.06	84.5
2961	do	do	Carlton-Haekney Drug Co., Durham, N. C.	99.00	.53	.47	97.5
6289	do	do	Farmers Union Agency Co., Winston-Salem, N. C.	99.44	.21	.35	84.5
6265	do	do	J. F. Fulton, Greensboro, N. C.	99.32	.16	.52	86.5
2962	do	do	Garrett & Stanfield Co., Roxboro, N. C.	99.41	.40	.19	91.0
6197	do	do	Gaston Seed & Prov. Co., Gastonia, N. C.	99.49	.33	.18	83.5
6201	do	do	do	98.46	.31	1.25	87.5
6367	do	do	do	99.00	.53	.47	87.5
6034	do	do	R. G. Hiatt & Co., Greensboro, N. C.	91.94	3.50	4.56	71.0
6463	(Wild carrot, Dodder.)	do	F. V. Hunter, Hendersonville, N. C.	93.26	.41	1.33	85.5
6200	do	do	Kiser & Mauney, Kings Mountain, N. C.	98.17	1.17	.66	91.5
6198	do	do	W. L. Klutz, Salisbury, N. C.	99.55	.37	.08	72.0
6032	do	do	W. A. Leslie, Morganton, N. C.	98.46	.73	.81	77.0
6368	do	do	Lowing & Costner, Lincolnton, N. C.	99.72	.12	.16	93.5
6369	do	do	do	99.67	.12	.21	97.0
6130	do	do	Frank McAuley, Mt. Gilead, N. C.	98.96	.52	.52	89.0

TABLE XII.—RESULTS OF TESTS OF 28 KINDS OF AGRICULTURAL SEEDS, 727 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913 TO JULY 15, 1914—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Pure Seed Per Cent of	Inert Matter Per Cent of	Foreign Seed Per Cent of	Per Cent of Germination
6267	Clover, Red	T. W. Wood & Sons, Richmond, Va.	McCrary Hardware Co., Asheboro, N. C.	99.70	.22	.05	89.5
6364	do	do	Miller-McLean Supply Co., Statesville, N. C.	97.72	.65	1.63	89.5
6033	(Canada Thistle.)	do	S. L. Owen & Co., Lexington, N. C.	99.36	.29	.35	98.0
6290	do	do	B. A. Poindexter, Winston-Salem, N. C.	99.52	.27	.21	96.0
6199	do	do	M. C. Ruffy, Salisbury, N. C.	99.16	.41	.43	87.0
6517	do	do	Sylvia Supply Co., Sylva, N. C.	99.88	.12	.10	96.5
6464	do	do	Thompson & Watkins, Rutherfordton, N. C.	99.39	.30	.31	95.5
6266	do	do	J. T. Turner, Asheboro, N. C.	99.49	.45	.06	96.0
6035	do	do	W. P. Ware, Reidsville, N. C.	99.34	.53	.13	87.5
6031	do	do	Paul Webb, Shelby, N. C.	99.43	.45	.12	96.5
6365	do	do	do	99.43	.20	.37	85.5
6572	do	do	W. S. White & Co., Elizabeth City, N. C.	94.30	2.97	2.73	90.5
6170	(Wild carrot, Dodder.)	do	Grant's Pharmacy, Asheville, N. C.	99.05	.65	.30	94.5
6471	do	do	Grant's Pharmacy, Asheville, N. C.	97.98	1.72	.30	95.0
6469	do	do	T. S. Morrison & Co., Asheville, N. C.	98.57	.86	.57	90.0
6472	(Wild carrot.)	do	Slayden, Fakes & Co., Asheville, N. C.	98.83	.53	.64	85.0
6473	do	do	L. R. Stricker, Asheville, N. C.	96.33	1.04	2.63	89.0
6502	CLOVER, SWEET	do	Boyd Feed Co., Hickory, N. C.	95.79	3.90	.31	44.5
6490	CLOVER, WHITE	do	Farmers Hardware & Supply Co., Hendersonville, N. C.	99.09	.09	.82	89.3

6095	do	do	W. A. Leslie, Morganton, N. C.	99.19	.33	.48	79.5
6254	do	do	W. S. White & Co., Elizabeth City, N. C.	98.08	.34	1.58	86.0
6571	do	do	do	98.38	.23	1.39	83.0
6339	CORN, FIELD	Barnard Seed Co., Chicago, Ill.	T. N. Waters & Bro., Goldsboro, N. C.				132.0
6462	do	Robert Buist Co., Philadelphia, Pa.	R. E. L. Cook, Tarboro, N. C.				96.0
6563	do	do	Hood & Grautham, Dunn, N. C.				94.0
6377	do	do	Loving & Costner, Lincolnton, N. C.				94.0
6566	do	Griffith & Turner Co., Baltimore, Md.	A. S. Huske, Fayetteville, N. C.				98.0
6493	do	D. Landreth Seed Co., Bristol, Pa.	Brevard Hardware Co., Brevard, N. C.				94.0
6376	do	do	J. H. Rudisill & Co., Lincolnton, N. C.				100.0
6460	do	J. B. Rice Seed Co., Cambridge, N. Y.	W. W. Parker, Henderson, N. C.				134.0
6461	do	do	do				94.0
6337	do	N. R. Savage & Son, Richmond, Va.	Y. H. Knowles, Mt. Olive, N. C.				100.0
6338	do	do	do				97.0
6378	do	do	J. E. Sloop, Statesville, N. C.				95.0
6379	do	do	do				98.0
6564	do	Slate Seed Co., South Boston, Va.	A. S. Huske, Fayetteville, N. C.				96.0
6565	do	do	do				98.0
6491	do	T. W. Wood & Sons, Richmond, Va.	Brevard Hardware Co., Brevard, N. C.				101.0
6492	do	do	do				96.0
6334	do	do	J. C. Horne, Magnolia, N. C.				96.0
6380	do	do	H. E. Kendall, Shelby, N. C.				95.0
6381	do	do	do				98.0
6335	do	do	B. F. Powell, Clinton, N. C.				94.0
6336	do	do	do				

TABLE XII.—RESULTS OF TESTS OF 28 KINDS OF AGRICULTURAL SEEDS, 727 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913 TO JULY 15, 1914—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Per Cent of Pure Seed	Per Cent of Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
6103	FESCUE, MEADOW	T. W. Wood & Sons, Richmond, Va.	Farmers Union Agency Co., Winston-Salem, N. C.	98.77	1.07	.16	84.5
6401	do.	do.	Gaston Seed & Prov. Co., Gastonia, N. C.	97.99	1.47	.54	†46.0
6162	RYEGRASS, ITALIAN	do.	Davidson & Wolfe, Charlotte, N. C.	97.84	.62	1.51	†45.5
6101	do.	do.	Farmers Union Agency Co., Winston-Salem, N. C.	98.51	.97	.52	†53.0
6100	do.	do.	W. A. Leslie, Morganton, N. C.	98.59	.64	.77	†15.0
6507	do.	do.	L. R. Stricker, Asheville, N. C.	97.19	2.05	.76	†30.5
6532	GRASS, ORCHARD	S. T. Beveridge & Co., Richmond, Va.	J. H. Ditmore, Bryson City, N. C.	72.35	25.81	1.84	69.5
6153	do.	do.	Farmers Supply Co., Charlotte, N. C.	84.75	14.69	.56	85
6270	do.	J. Bolgiano & Son, Baltimore, Md.	Beeson Hardware Co., High Point, N. C.	88.27	9.86	1.87	86.5
2966	do.	do.	H. W. & J. C. Webb, Hillsboro, N. C.	76.98	17.88	5.14	84.0
6482	(Wild onion.)	J. J. Buffington & Co., Baltimore, Md.	J. D. Blanton, Marion, N. C.	77.91	21.10	.99	38.5
6527	(Wild onion.)	Hackney, Broyles & Lackey Co., Knoxville, Tenn.	R. H. Hyatt, Murphy, N. C.	*37.66	51.50	10.84	†66.5
6528	do.	do.	Tweed & Franklin, Marshall, N. C.	*35.65	59.79	4.56	79.5
2559	do.	Hartin, Hamilton & Lewman, Louisville, Ky.	Davidson & Wolfe, Charlotte, N. C.	73.16	26.10	.74	89.5
6152	do.	do.	do.	86.19	13.42	.39	89.5
6232	do.	do.	do.	97.27	2.34	.39	86.0
2794	do.	do.	J. O. Houston & Son, Hendersonville, N. C.	*68.76	30.22	1.02	87.5
2795	do.	do.	Hunter Pharmacy, Hendersonville, N. C.	*55.40	43.20	1.40	81.0

(Cheat.)

6331	do.	Lewis & Chambers, Louisville, Ky.	G. L. Hampton, Canton, N. C.	82.61	17.17	.22	95.0
6330	do.	Louisville Seed Co., Louisville, Ky.	B. H. Cathey & Co., Sylva, N. C.	*51.08	48.14	.78	84.0
2797	do. ( <i>Cheat.</i> )	do.	Grant's Pharmacy, Asheville, N. C.	*59.30	39.86	.84	83.5
2796	do.	do.	R. H. Hyatt & Co., Murphy, N. C.	79.16	19.66	1.18	84.0
2798	do.	National Seed Co., Louisville, Ky.	Slayden, Fakes & Co., Asheville, N. C.	85.35	14.66	.09	82.0
6295	do.	N. R. Savage & Son, Richmond, Va.	Farmers Cash Feed Store, Winston-Salem, N. C.	81.71	14.84	3.45	70.5
6088	do.	do.	Hazell & Mims, Reidsville, N. C.	80.39	17.07	2.54	88.0
6271	do.	do.	do.	85.25	7.86	6.89	86.5
6294	do.	do.	Miller Grocery Co., Wilkesboro, N. C.	78.20	16.24	5.56	69.5
6272	do.	do.	Mt. Airy Feed Store, Mt. Airy, N. C.	73.92	23.63	2.45	71.5
2965	do.	do.	Hugh Woods, Roxboro, N. C.	69.86	20.01	10.13	78.0
6385	do. ( <i>Wild onion.</i> )	do.	W. M. Neel & Co., Mooresville, N. C.	90.04	9.24	.72	96.0
6481	do.	Wm. G. Scarlett & Co., Baltimore, Md.	Shuping & Poteat, Morganton, N. C.	85.39	13.83	.78	90.0
6083	do.	do.	Beeson Hardware Co., High Point, N. C.	84.74	14.01	1.25	91.5
6193	do.	T. W. Wood & Sons, Richmond, Va.	Cline & Moose, Concord, N. C.	88.46	8.58	2.96	85.5
6084	do. ( <i>Quack grass.</i> )	do.	Crutchfield Hardware Co., Thomasville, N. C.	*68.15	28.63	3.22	74.0
6383	do.	do.	Gaston Seed & Prov. Co., Gastonia, N. C.	83.90	9.62	6.48	90.5
6154	do.	do.	The Hardware Store, Siler City, N. C.	70.99	25.57	3.44	167.0
2964	do.	do.	Haywood & Boone, Durham, N. C.	79.32	20.58	.10	92.0
6086	do.	do.	H. E. Kendall, Shelby, N. C.	89.30	7.63	3.04	86.5
6382	do.	do.	do.	80.65	17.79	1.56	83.0
6194	do.	do.	W. L. Klutz, Salisbury, N. C.	90.59	7.02	2.39	89.0
6085	do.	do.	W. A. Leslie, Morganton, N. C.	69.83	29.64	.53	78.5
6384	do.	do.	Lowing & Costner, Lenoir, N. C.	88.16	9.13	2.71	86.5
6212	do.	do.	Miller-McLean Supply Co., Statesville, N. C.	85.90	13.23	.87	93.5

TABLE XII—RESULTS OF TESTS OF 28 KINDS OF AGRICULTURAL SEEDS, 727 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913 TO JULY 15, 1914—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Pure Cent of Seed	Per Cent of Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
6529	GRASS, ORCHARD. ( <i>Cheat</i> )	T. W. Wood & Sons, Richmond, Va.	Sylva Supply Co., Sylva, N. C.	76.98	21.56	1.46	81.0
6087	do. ( <i>Wild carrot</i> )	do.	Thomasville Hardware Co., Thomasville, N. C.	69.85	27.57	2.58	79.0
2872	do.	do.	Wolfe Drug Co., Waxhaw, N. C.	71.46	26.94	1.60	†69.0
2774	do. ( <i>Wild onion</i> )		Farmers Union Agency Co., Winston-Salem, N. C.	*59.02	34.77	6.21	82.5
6484	do.		T. S. Morrison & Co., Asheville, N. C.	83.86	9.97	6.17	77.0
6485	do.		Slayden, Fakes & Co., Asheville, N. C.	76.85	17.65	5.50	74.5
6483	do.		L. R. Stricker, Asheville, N. C.	62.38	6.41	1.21	92.0
6503	RYEGRASS, PERENNIAL	T. W. Wood & Sons, Richmond, Va.	Boyd Feed Co., Hickory, N. C.	*94.61	1.57	3.79	†62.0
6102	do.	do.	Farmers Union Agency Co., Winston-Salem, N. C.	96.01	.82	3.17	†42.5
6281	do.	do.	J. T. Turner, Asheville, N. C.	97.32	.86	1.82	†50.0
6540	OATGRASS, TALL	S. T. Beveridge & Co., Richmond, Va.	J. H. Ditmore, Bryson City, N. C.	74.36	23.33	2.31	†59.0
6395†	do. ( <i>Wild onion</i> )	N. R. Savage & Son, Richmond, Va.	J. E. Sloop, Statesville, N. C.				
6204	do. ( <i>Quack grass</i> )	T. W. Wood & Sons, Richmond, Va.	Cline & Moose, Concord, N. C.	87.65	9.84	2.51	†51.5
6295	do.	do.	Farmers Cash & Feed Store, Winston-Salem, N. C.	79.43	12.11	8.46	†66.0
6277	do.	do.	J. F. Fulton, Greensboro, N. C.	83.43	12.42	4.15	†63.5
6205	do. ( <i>Wild onion</i> )	do.	Gaston Seed & Prov. Co., Gastonia, N. C.	72.56	15.73	11.71	†40.5
6394	do.	do.	do.	*61.28	21.21	14.51	74.0

2807	do ( <i>Cheat</i> )	do	Grant's Pharmacy, Asheville, N. C.	83.54	9.39	7.07	43.5
6099	do ( <i>Cheat</i> )	do	W. A. Leslie, Morganton, N. C.	83.53	13.29	3.18	455.0
6098	do	do	S. L. Owen & Co., Lexington, N. C.	92.72	7.08	.20	459.5
6339	do	do	Sylva Supply Co., Sylva, N. C.	87.37	11.64	.99	79.5
6508	MULLET, GERMAN ( <i>Wild carrot</i> )	J. J. Buffington & Co., Baltimore, Md.	W. S. White & Co., Elizabeth City, N. C.	99.08	.52	.40	86.0
2910	do	Carter, Venable & Co., Richmond, Va.	E. O. McGowan, Elm City, N. C.	96.35	2.32	1.33	452.5
6105	do	Diggs & Beadles, Richmond, Va.	Thomasville Drug Co., Thomasville, N. C.	95.07	4.38	.55	93.5
6505	do	N. R. Savage & Son, Richmond, Va.	City Feed Co., Hickory, N. C.	99.10	.63	.27	479.0
6403	do	do	Geo. Moose, Newton, N. C.	97.90	1.92	.18	455.0
6106	do	T. W. Wood & Sons, Richmond, Va.	Carolina Warehouse, Greensboro, N. C.	93.83	.75	.42	458.0
6437	do	do	S. E. Dilday, Ahoskie, N. C.	96.48	3.14	.38	499.5
6567	do	do	Wilson Drug Co., Wilson, N. C.	95.81	.06	.33	89.5
6506	do	do	L. R. Stricker, Asheville, N. C.	98.65	.55	.80	426.0
6559	MULLET, PEARL	Robert Buist & Co., Philadelphia, Pa.	Doane Herring, Wilson, N. C.	98.84	1.16	-----	84.0
6560	do	do	Hood & Grantham, Dunn, N. C.	*97.90	2.10	-----	89.0
6561	do	D. Landreth Seed Co., Bristol, Pa.	Henry Dunn, Kinston, N. C.	*98.33	1.67	-----	91.0
2998†	do	T. W. Wood & Sons, Richmond, Va.	Hardy Drug Co., Washington, N. C.	-----	-----	-----	-----
6350	do	do	T. N. Waters & Bro., Goldsboro, N. C.	*98.25	1.75	-----	88.5
6562	do	do	Williams Drug Store, Goldsboro, N. C.	*97.94	2.06	-----	88.5
6510	OATS	Adams Grain & Prov. Co., Asheville, N. C.	J. H. Ditmore, Bryson City, N. C.	*96.54	2.43	1.03	95.0
6511	do	do	Sylva Cash Store, Sylva, N. C.	97.61	2.39	-----	95.0
6478	do ( <i>Wild mustard</i> )	Adams Grain & Prov. Co., Nashville, Tenn.	W. S. Ashworth & Sons, Brevard, N. C.	*95.27	3.45	1.28	95.0
6516	do	do	J. C. Cole, Canton, N. C.	*96.63	2.89	.48	92.0
6434	do	Adams Grain & Prov. Co., Norfolk, Va.	Bellamy & Co., Enfield, N. C.	*92.76	6.00	.64	98.5
6455	do	do	do	*97.23	.92	1.85	486.0

TABLE XII.—RESULTS OF TESTS OF 28 KINDS OF AGRICULTURAL SEEDS, 727 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913 TO JULY 15, 1914—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Pure Cent of Seed	Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
6333	MILLET, PEARL.....	Adams Grain and Prov. Co., Norfolk, Va.	R. C. Carnon & Son, Ayden, N. C.	*95.65	2.41	1.94	†67.0
6247	do. (Wild mustard.)	do.	Chadbourn Grocery Co., Chadbourne, N. C.	*95.94	1.27	2.79	†79.5
6436	do.	do.	W. S. Clarke & Sons, Tarboro, N. C.	*90.47	7.45	2.08	†78.0
6437	do.	do.	do.	*96.58	3.24	.18	97.5
6438	do.	do.	Geo. S. Edwards, Rocky Mount, N. C.	*90.98	8.11	.91	97.5
6178	do.	do.	Florence Mills, Forest City, N. C.	98.19	1.04	.77	†81.5
6439	do.	do.	McKinne Bros. & Co., Louisburg, N. C.	*97.02	1.10	1.88	†79.0
6440	do.	do.	do.	98.13	1.51	.36	99.5
6441	do.	do.	T. C. May & Son, Spring Hope, N. C.	*87.79	10.30	1.91	97.5
6332	do.	do.	H. G. Munford, Ayden, N. C.	*96.03	3.60	.37	93.5
6248	do.	do.	C. L. Spencer, New Bern, N. C.	*96.12	2.36	1.52	98.0
6046	do. (Wild mustard.)	Adams Grain & Prov. Co., Richmond, Va.	Farmers Union Agency Co., Winston-Salem, N. C.	*96.84	1.22	1.94	†70.5
2958	do.	do.	Parham Supply Co., Henderson, N. C.	*94.96	4.45	.59	†6.5
6305	do.	S. T. Beveridge & Co., Richmond, Va.	J. B. Cox, Warsaw, N. C.	98.16	1.56	.28	99.5
6306	OATS.	do.	J. B. Cox, Warsaw, N. C.	*96.87	2.92	.21	98.5
6359	do.	do.	J. N. Dellinger, Shelby, N. C.	97.65	2.03	.32	98.0
6509	do.	do.	J. H. Ditmore, Bryson City, N. C.	*91.21	8.43	.36	6.5
6047	do. (Corn cockle, Wild mustard.)	do.	Farmers Cash & Feed Store, Winston-Salem, N. C.	99.34	.66	-----	98.0
6330	do. (Wheat.)	do.	Hall Mercantile Co., Wallace, N. C.	98.98	.41	.61	97.0

6407	do	do	W. T. Hancock & Co., Scotland Neck, N. C.	98.00	1.82	.18	100.0
6476	do	do	Harrison & Co., Lenoir, N. C.	*96.62	2.91	.47	96.5
6477	do	do	do	*96.69	1.79	1.32	98.5
6544	do	do	Harrison Bros. & Co., Williamston, N. C.	*94.36	5.49	.15	98.0
6222	do	do	Jas. E. Jordan, Dunn, N. C.	*97.35	2.18	.47	95.0
6545	do	do	C. E. Kornegay, Selma, N. C.	*90.46	7.66	1.88	†64.5
6409	do	do	Lawrence Bros., Enfield, N. C.	*96.55	3.45	---	98.0
6307	do	do	Theo. Middleton, Magnolia, N. C.	*93.98	5.54	.48	89.5
6410	do	do	Parham Supply Co., Henderson, N. C.	*97.27	2.59	.14	98.5
6408	do	do	R. B. Peters Grocery Co., Tarboro, N. C.	*97.00	2.85	.15	97.0
6411	do	do	N. L. Stedman & Co., Halifax, N. C.	*96.54	3.20	.26	99.5
6453	do	do	Lynn-Winston Co., Oxford, N. C.	97.57	2.17	.26	95.5
6454	do	do	do	*96.42	3.26	.32	98.0
6455	do	do	do	*97.38	2.59	.03	90.5
6456	do	do	do	*94.50	3.36	2.14	96.5
6452	do	do	S. J. Stallings, Littleton, N. C.	*95.50	4.50	---	97.5
6358	do	do	Walker's Bargain House, Mocksville, N. C.	*97.41	2.42	.17	96.5
2954	do	do	Winston-Long Co., Oxford, N. C.	*97.39	2.61	---	95.0
6223	do	do	J. W. Carter, Maxton, N. C.	*97.34	1.83	.83	94.0
6172	do	do	H. M. Blackwelder, Concord, N. C.	*96.51	2.48	1.01	†58.5
6256	do	do	J. H. Burton, Reidsville, N. C.	*81.72	13.89	4.39	†35.0
6413	do	do	Franklin Grocery Co., Franklinton, N. C.	*96.69	3.14	.17	99.5
6414	do	do	do	*93.58	3.75	2.67	†49.5
6257	do	do	J. F. Fulton, Greensboro, N. C.	*82.41	14.46	3.13	†47.5
6224	do	do	W. J. Glass, Concord, N. C.	*96.57	2.09	1.34	96.0
6225	do	do	do	*84.83	12.24	2.93	†34.0

TABLE XII.—RESULTS OF TESTS OF 28 KINDS OF AGRICULTURAL SEEDS, 727 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913 TO JULY 15, 1914—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Pure Seed Per Cent of	Inert Matter Per Cent of	Foreign Seed Per Cent of	Per Cent of Germination
6415	OATS	Diggs & Beadles, Richmond, Va.	Horner Bros., Oxford, N. C.	*84.14	15.27	4.59	†42.5
6416	do. (Wild mustard, Cheat.)	do.	do.	*96.19	3.56	.25	96.5
6302	do.	Dixon & Etheridge, Goldsboro, N. C.	M. J. Best & Son, Goldsboro, N. C.	*94.76	4.29	.97	97.0
6316	do.	do.	Ray Dawson, Kinston, N. C.	93.54	1.32	.14	99.0
6317	do. (Cheat.)	do.	do.	*95.49	4.51	.02	96.0
6546	do.	do.	do.	93.12	1.98	-----	99.0
6300	do.	do.	Deans & Moye Co., Goldsboro, N. C.	*97.28	2.58	.14	97.5
6301	do.	do.	Z. M. L. Jeffreys, Goldsboro, N. C.	*95.90	3.43	.67	90.0
6315	do.	do.	E. S. Mewborn, La Grange, N. C.	*93.41	5.61	.98	†65.5
6327	do.	do.	Mt. Olive Grocery and Hardware Co., Mt. Olive, N. C.	97.51	2.25	.24	97.5
6299	do.	do.	Thompson & Sons, Goldsboro, N. C.	*91.97	7.86	.17	95.5
6250	do.	D. L. Gore, Wilmington, N. C.	Loulenon & Loulenon, Chadbourne, N. C.	*97.29	2.10	.61	93.0
6328	do.	Hall & Pearsall, Wilmington, N. C.	C. Harrell & Son, Burgaw, N. C.	*95.96	3.51	.51	98.5
6329	do. (Cheat.)	do.	Wallace Grocery Co., Wallace, N. C.	*96.43	3.57	-----	98.5
6514	do.	Hardin, Hamilton & Lewman, Louist., Ky.	Madison County Farmers Union, Marshall, N. C.	*95.41	4.57	.02	96.5
6228	do.	Harsh Grain Co., Nashville, Tenn.	McRae Grocery Co., Rockingham, N. C.	*96.38	3.50	.12	98.5
6312	do. (Wild onion.)	E. G. Hines, Goldsboro, N. C.	Aman Grocery Co., Clinton, N. C.	97.87	2.04	.09	98.0
6303	do.	do.	M. J. Best & Son, Goldsboro, N. C.	*95.91	2.68	1.41	95.0
6304	do.	do.	Hobbs & Russ, Warsaw, N. C.	*91.43	4.26	1.31	93.5

6314	do	T. W. Pace, La Grange, N. C.	93.17	1.83	95.5
6311	do	J. C. Peterson, Clinton, N. C.	97.63	2.19	95.0
6313	do	B. F. Powell, Clinton, N. C.	93.64	1.36	100.0
6221	do	Selma Supply Co., Selma, N. C.	*91.04	8.28	94.5
6231	do	W. M. Sanders, Smithfield, N. C.	*95.28	2.89	93.0
6425	do (Wild mustard.)	Arrington-Bissett Co., Nashville, N. C.	*96.72	1.77	89.5
6323	do	Geo. D. Best & Sons, Fremont, N. C.	*91.71	7.54	92.0
6427	do	Cockerell & Williams Co., Nashville, N. C.	*92.12	6.22	96.5
6321	do	R. L. Davis & Bros., Farmville, N. C.	*87.62	12.05	92.0
6423	do	N. B. Finch & Co., Spring Hope, N. C.	*95.86	2.89	93.0
6424	do	do	*91.85	6.24	1.91
6422	do	W. H. Griffen & Co., Spring Hope, N. C.	97.93	1.38	987.5
6322	do	Hooks, Ballance & Co., Fremont, N. C.	*91.68	6.45	98.5
6319	do	J. B. Johnston, Greenville, N. C.	*91.95	7.88	89.5
6428	do	King Cooperative Co., Nashville, N. C.	*95.92	2.13	94.0
6429	do (Wild mustard.)	Littleton Feed & Grocery Co., Littleton, N. C.	*91.13	8.64	981.5
6426	do	Nash Supply Co., Nashville, N. C.	*95.82	3.12	99.5
6324	do	Z. M. L. Peacock, Fremont, N. C.	*88.86	9.99	1.15
6320	do	L. M. Savage, Greenville, N. C.	*89.45	9.62	98.0
6421	do (Wild mustard, Cheat.)	T. L. Warsley, Rocky Mount, N. C.	*90.07	8.07	96.0
6480	do	Williams & Erwin, Rutherfordton, N. C.	*93.22	6.57	90.5
6249	do	Chas. B. Hill, New Bern, N. C.	*96.19	3.32	96.0
6318	do (Cheat.)	T. W. Mewborn & Co., Kinston, N. C.	*96.39	3.51	98.0
6347	do	A. L. Owen, Plymouth, N. C.	*95.20	4.66	97.5
6348	do	H. C. Prevatt, Edenton, N. C.	*91.46	5.99	89.5
6420	do	Bellamy Co., Enfield, N. C.	*96.89	2.27	98.5

TABLE XII.—RESULTS OF TESTS OF 28 KINDS OF AGRICULTURAL SEEDS, 727 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913 TO JULY 15, 1914—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer		Retail Dealer		Per Cent of Pure Seed	Per Cent of Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
6419	OATS.....	W. F. Richardson, Jr., & Co., Richmond, Va.		Curtis Pierce & Co., Enfield, N. C.		*96.33	2.50	1.17	99.5
6433	do.....	Roper & Co., Petersburg, Va.		J. W. & D. S. Fuller, Oxford, N. C.		*87.45	5.87	6.68	92.0
6430	do.....	do.....		Eugene Johnson, Littleton, N. C.		*97.17	.95	1.88	97.5
6432	( <i>Wheat</i> ).....	do.....		R. S. Montague, Oxford, N. C.		*88.55	11.13	.32	175.5
6431	do.....	do.....		L. J. Moore, Weldon, N. C.		*95.73	4.17	.10	98.5
6286	do.....	N. R. Savage & Son, Richmond, Va.		J. J. Adams Sons Co., Winston-Salem, N. C.		*96.03	3.80	.17	100.0
6287	do.....	do.....		do.....		*96.89	2.71	.40	97.0
6218	do.....	do.....		Austin-Stephens Co., Smithfield, N. C.		*95.26	2.45	2.29	90.5
6442	do.....	do.....		Beacom Supply Co., Henderson, N. C.		*96.28	3.50	.22	98.0
2956	do.....	do.....		J. D. Brooks, Oxford, N. C.		98.74	1.26	-----	184.5
2957	do.....	do.....		Carlton-Hackney Drug Co., Durham, N. C.		99.30	.70	-----	92.0
6479	do.....	do.....		City Feed Co., Hickory, N. C.		97.89	2.02	.09	99.5
6445	do.....	do.....		Edwards & Co., Scotland Neck, N. C.		*96.47	3.38	.15	93.5
6446	do.....	do.....		do.....		98.48	1.35	.17	93.0
6284	do.....	do.....		Farmers Union Agency Co., Winston-Salem, N. C.		*96.92	2.93	.15	100.0
6285	do.....	do.....		do.....		*96.41	.90	2.69	94.0
6430	( <i>Wheat, Corn cockle, Wild onion.</i> ).....	do.....		J. W. & D. S. Fuller, Oxford, N. C.		98.57	1.10	.33	99.0
6451	do.....	do.....		do.....		98.06	1.85	.09	100.0
6258	do.....	do.....		J. F. Fulton, Greensboro, N. C.		98.48	1.33	.19	98.5

6259	do.	do.	do.	do.	do.	97.82	1.93	.25	92.0
6260	do.	do.	do.	Harris & McNeely, Mooresville, N. C.		*94.17	3.49	2.34	95.5
6261	do.	do.	do.	do.		98.60	1.32	.08	100.0
6262	do.	do.	do.	do.		98.21	1.79		95.0
6216	do.	do.	do.	Hazel & Mims, Reidsville, N. C.		98.96	1.04		97.0
6261	do.	do.	do.	do.		*96.31	3.69		89.5
6447	do.	do.	do.	M. Hoffman & Bro., Scotland Neck, N. C.		*97.09	1.60	1.31	99.0
6448	do.	do.	do.	do.		*97.11	2.49	.40	100.0
2955	do.	do.	do.	Horner Bros., Oxford, N. C.		97.55	2.42		97.5
6449	do.	do.	do.	Horner Bros., Oxford, N. C.		97.97	1.97	.06	99.5
6217	do.	do.	do.	W. L. Klutz, Salisbury, N. C.		97.52	1.92	.56	186.5
6226	(Cheat.)	do.	do.	E. G. Martin, Son & Co., Mt. Olive, N. C.		*95.82	1.65	2.33	99.5
6260	do.	do.	do.	W. E. Merritt & Co., Mt. Airy, N. C.		*96.46	3.40	.14	98.5
6282	(Cheat.)	do.	do.	Miller Grocery Co., Wilkesboro, N. C.		97.68	2.09	.23	92.5
6283	(Wild mustard.)	do.	do.	do.		*96.92	3.00	.08	96.5
6045	do.	do.	do.	Mt. Airy Feed Store, Mt. Airy, N. C.		98.54	1.46		179.0
6443	do.	do.	do.	Parham Supply Co., Henderson, N. C.		*96.31	.93	2.76	91.0
6444	(Cheat, Corn cockle.)	do.	do.	do.		*96.77	3.06	.17	99.0
6141	do.	do.	do.	W. M. Sanders, Smithfield, N. C.		98.86	.19	.95	93.0
6142	(Cheat, Corn cockle.)	do.	do.	Selma Supply Co., Selma, N. C.		99.35	.44	.21	95.0
6220	(Cheat.)	do.	do.	do.		98.26	1.37	.37	95.5
6363	do.	do.	do.	J. E. Sloop, Statesville, N. C.		*96.73	3.26	.01	99.5
2907	do.	do.	do.	R. S. Wells, Elm City, N. C.		99.00	.62	.38	187.0
6225	do.	do.	do.	Yelverton & Bros., Fremont, N. C.		*97.36	2.24	.40	100.0
6418	do.	do.	do.	Southern Distributing Co., Norfolk, Va.		*97.36	2.64		97.5
6449	do.	do.	do.	W. A. Roberson & Co., Robersonville, N. C.		*96.45	2.16	1.39	95.5

TABLE XII.—RESULTS OF TESTS OF 28 KINDS OF AGRICULTURAL SEEDS, 727 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913 TO JULY 15, 1914—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Pure Seed of Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
6417	Oats	Southern Distributing Co., Norfolk, Va.	J. P. Williams & Bros., Aloskie, N. C.	*95.65	3.01	97.0
6513	do. (Wild mustard.)	W. R. Tate, Nashville, Tenn.	A. L. Plennons, Marshall, N. C.	*94.84	2.92	91.5
6512	do.	do.	Sylvia Supply Co., Sylva, N. C.	*96.32	3.01	91.0
6229	do.	do.	J. L. Thompson, Dunn, N. C.	97.68	2.32	95.5
6219	do.	Tennessee Grain Co., Nashville, Tenn.	Johnson Bros., Dunn, N. C.	*90.56	9.43	471.5
6356	do.	T. W. Wood & Sons, Richmond, Va.	J. T. Angell, Mocksville, N. C.	98.38	.39	474.5
6357	do. (Wheat)	do.	do.	98.11	1.84	.05
6353	do.	do.	J. B. Barnes, Taylorsville, N. C.	*95.94	3.57	.49
6406	do.	do.	Burrongs Grocery Co., Warrenton, N. C.	99.23	.25	.52
6143	do. (Wheat)	do.	A. W. E. Capel, Troy, N. C.	99.15	.49	.36
6226	do.	do.	Cline & Moose, Concord, N. C.	*97.21	2.05	.74
6246	do.	do.	Walter Credle & Co., Washington, N. C.	98.12	1.64	.27
6331	do.	do.	Duplin Grocery Co., Wallace, N. C.	97.77	2.09	.14
6309	do.	do.	Geo. Edwards, Magnolia, N. C.	97.94	1.95	.11
6242	do. (Wild mustard, Cheat.)	do.	A. C. Foster, Maysville, N. C.	98.28	1.46	.26
6354	do.	do.	Gaston Seed & Prov. Co., Gastonia, N. C.	98.82	1.03	.15
6355	do.	do.	do.	*96.19	3.08	.73
6308	do. (Wheat)	do.	Roy Hill & Co., Magnolia, N. C.	97.99	1.95	.06
6310	do.	do.	J. G. Hobbs, Clinton, N. C.	*97.01	.60	2.39
6227	do. (Wild mustard.)	do.	A. S. Huske, Fayetteville, N. C.	*96.87	2.03	1.10
	do. (Wheat, Wild onion.)	do.				95.0

6048	do.	do.	H. E. Kendall, Shelby, N. C.	*96.89	3.10	.01	99.5
6049	do.	do.	do.	*93.75	1.17	5.08	89.5
6050	do.	do.	do.	99.34	.66	-----	96.0
6175	do.	do.	W. L. Klutz, Salisbury, N. C.	*97.03	2.97	-----	98.0
6175	do.	do.	do.	98.01	.21	1.78	98.5
6177	do.	do.	do.	99.30	.70	-----	89.5
6412	do.	do.	McGhee-Joyner Co., Franklinton, N. C.	99.20	.79	.01	100.0
2908	do.	do.	E. O. McGowan, Elm City, N. C.	98.06	.41	1.53	98.5
6515	do.	do.	Madison County Farmers Union, Marshall, N. C.	*97.17	2.76	.07	99.0
6345	do.	do.	T. P. Nash, Elizabeth City, N. C.	98.71	1.22	.07	100.0
6551	do.	do.	Roberson-Holiday Co., Robersonville, N. C.	*97.13	2.46	.41	99.0
6550	do.	do.	J. H. Roberson & Co., Robersonville, N. C.	98.45	1.15	-----	97.5
6144	do.	do.	Saunders & Co., Troy, N. C.	99.38	.62	-----	94.5
6051	do.	do.	C. Scott & Co., Greensboro, N. C.	97.51	2.31	.18	98.0
6052	do.	do.	do.	97.91	1.49	.60	106.0
6255	do.	do.	C. Scott & Co., Greensboro, N. C.	98.92	.98	.10	99.5
6053	do.	do.	W. P. Ware, Reidsville, N. C.	99.46	.54	-----	92.0
6173	do.	do.	White, Morrison, Flowe Co., Concord, N. C.	97.79	.31	1.90	98.5
6174	do.	do.	do.	97.58	1.66	.76	131.0
6243	do.	do.	W. S. White & Co., Elizabeth City, N. C.	99.05	.95	-----	97.0
6244	do.	do.	do.	*96.87	1.90	1.23	97.0
6552	do.	do.	do.	97.87	2.13	-----	95.0
6054	do.	Locally grown	Hickory Seed Co., Hickory, N. C.	*97.11	2.01	.88	95.0
6231	do.	do.	Jno. F. McNair, Laurinburg, N. C.	*94.64	4.85	.51	93.0
6474	do.	do.	L. R. Strjoker, Asheville, N. C.	*94.71	3.95	1.34	94.0

TABLE XII.—RESULTS OF TESTS OF 28 KINDS OF AGRICULTURAL SEEDS, 727 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913 TO JULY 15, 1914—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Per Cent of Pure Seed	Per Cent of Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
6475	OATS ( <i>Wild mustard.</i> )	Locally grown.	L. R. Stricker, Asheville, N. C.	*95.20	4.11	.69	92.0
6405	PEA, FIELD	J. J. Buffington & Co., Baltimore, Md.	N. S. White & Co., Elizabeth City, N. C.				55.5
6569	do.	do.	do.				66.0
6097	RAPE	S. T. Beveridge & Co., Richmond, Va.	Harrison & Co., Lenoir, N. C.	99.64	.33	.03	92.5
2788	do.	do.	Planters Supply Co., Nashville, N. C.	98.85	.52	.63	94.0
6347	do.	do.	T. L. & W. J. Turnage Co., Farmville, N. C.	98.57	.43		95.5
2789	do.	do.	J. D. Winstead & Son, Nashville, N. C.	99.59	.41		93.5
6458	do.	Robert Buist Co., Philadelphia, Pa.	R. E. L. Cook, Tarboro, N. C.	99.19	.80	.01	98.0
6558	do.	do.	Doane Herring, Wilson, N. C.	99.27	.63	.10	94.0
6252	do.	J. J. Buffington & Co., Baltimore, Md.	T. P. Nash, Elizabeth City, N. C.	99.41	.59		98.5
6494	do.	Carter, Venable & Co., Richmond, Va.	Houston & Sons, Hendersonville, N. C.	99.64	.36		185.5
2970	do.	do.	C. E. King & Sons, Durham, N. C.	99.54	.35	.11	80.5
2783	do.	Diggs & Beadles, Richmond, Va.	Deans & Moyeler, Goldsboro, N. C.	99.43	.54	.03	93.0
2825	do.	do.	Z. M. L. Jeffreys, Goldsboro, N. C.	99.19	.81		98.0
6345	do.	D. Landreth Seed Co., Bristol, Pa.	Temple Drug Co., Kinston, N. C.	98.41	1.54	.08	90.0
6346	do.	Leonard Seed Co., Chicago, Ill.	J. E. Hood & Co., Kinston, N. C.	98.78	1.18	.04	91.5
6556	do.	J. B. Rice Seed Co., Cambridge, N. Y.	J. F. Clarke, New Bern, N. C.	99.41	.59		89.5
6241	do.	do.	A. S. Huske, Fayetteville, N. C.	99.70	.30		92.0
6557	do.	do.	do.	99.65	.32	.03	187.5
6348	do.	do.	J. M. Lewis, Mt. Olive, N. C.	*98.47	.46	.07	96.0

6459	do.	W. W. Parker, Henderson, N. C.	99.39	.61	90.5
6349	do.	T. N. Waters & Bro., Goldsboro, N. C.	98.65	.35	91.5
6388	do.	Gaston Seed & Prov. Co., Gastonia, N. C.	99.15	.84	97.0
2860	do.	Parson Drug Co., Wadesboro, N. C.	99.91	.07	*20.0
6387	do.	J. E. Sloop, Statesville, N. C.	98.57	1.43	97.0
2822	do.	L. H. Caldwell, Lumberton, N. C.	99.51	.49	93.5
2988	do.	R. E. L. Cook, Tarboro, N. C.	99.21	.79	99.5
2781	do.	Geo. E. Daniels, Goldsboro, N. C.	99.16	.76	92.0
2824	do.	A. J. Floyd, Fairmont, N. C.	99.65	.35	93.0
2823	do.	M. W. Floyd, Lumberton, N. C.	99.42	.52	96.0
6278	do.	J. F. Fulton, Greensboro, N. C.	99.44	.52	96.5
6196	do.	Gaston Seed & Prov. Co., Gastonia, N. C.	99.80	.20	†81.5
2989	do.	J. E. Hood & Co., Kinston, N. C.	98.60	1.05	98.0
2990	do.	A. S. Huske, Fayetteville, N. C.	99.57	.43	91.5
6342	do.	Isbel & Peele, La Grange, N. C.	*98.47	.53	95.0
6341	do.	J. B. Johnston, Greenville, N. C.	98.75	1.25	93.0
6555	do.	H. C. Joyner, Rocky Mount, N. C.	99.32	.68	99.5
6195	do.	W. L. Klutz, Salisbury, N. C.	99.16	.84	95.0
2987	do.	Lucas & Bass Co., Lucama, N. C.	99.10	.90	97.5
6214	do.	Miller-McLean Supply Co., Statesville, N. C.	99.38	.62	98.0
6386	do.	do.	*98.30	.67	97.5
6343	do.	B. F. Powell, Clinton, N. C.	98.54	.46	94.0
6096	do.	C. Scott & Co., Greensboro, N. C.	99.55	.45	†85.0
6344	do.	Wallace Grocery Co., Wallace, N. C.	99.70	.30	95.0
2782	do.	T. W. Waters & Bro., Goldsboro, N. C.	99.47	.53	94.5
2821	do.	Whitakers Pharmacy, Whitakers, N. C.	99.64	.34	96.0

TABLE XII.—RESULTS OF TESTS OF 28 KINDS OF AGRICULTURAL SEEDS, 727 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913 TO JULY 15, 1914—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Pure Seed of Per Cent of	Inert Matter of Per Cent of	Foreign Seed of Per Cent of	Germination of Per Cent of
6553	RAPE.....	T. W. Wood & Sons, Richmond, Va.....	W. S. White & Co., Elizabeth City, N. C.....	*97.49	2.32	.19	89.5
6554	do.....	do.....	Williams Drug Co., Goldsboro, N. C.....	99.45	.48	.07	93.5
6340	do.....	do.....	W. V. Williams, Goldsboro, N. C.....	98.99	1.01	-----	96.0
2871	do.....	do.....	Wolfe Drug Co., Waxhaw, N. C.....	99.45	.51	.04	92.0
6508	do.....	do.....	L. R. Stricker, Asheville, N. C.....	99.25	.55	.20	*81.0
6298	REDTOP.....	S. T. Beveridge & Co., Richmond, Va.....	J. J. Adams Sons Co., Winston-Salem, N. C.....	*88.94	9.69	1.82	87.5
6055	do.....	do.....	Harrison & Co., Lenoir, N. C.....	92.55	6.76	.69	85.5
6253	do.....	J. J. Buffington & Co., Baltimore, Md.....	T. P. Nash, Elizabeth City, N. C.....	*46.46	21.75	31.79	89.8
6574	do.....	do.....	do.....	*46.17	20.56	33.27	89.8
2995	do.....	Diggs & Beadles, Richmond, Va.....	A. S. Huske, Fayetteville, N. C.....	93.21	5.91	.88	80.8
6537	do.....	Hackney, Broyles & Lackey Co., Knoxville, Tenn.....	R. H. Hyatt & Co., Murphy, N. C.....	*69.67	21.61	8.72	81.5
2791	do.....	Hardin, Hamilton & Lewman, Louisville, Ky.....	Byers Bros., Hendersonville, N. C.....	89.62	9.25	1.13	70.5
2803	do.....	do.....	Hunter Pharmacy, Hendersonville, N. C.....	92.17	6.63	1.20	74.3
6060	do.....	do.....	C. Scott & Co., Greensboro, N. C.....	*81.51	13.02	5.47	90.0
2805	do.....	Louisville Seed Co., Louisville, Ky.....	Grant's Pharmacy, Asheville, N. C.....	91.39	7.89	.72	84.0
2804	do.....	do.....	R. H. Hyatt & Co., Murphy, N. C.....	95.13	4.68	.19	81.0
6061	do.....	N. R. Savage & Co., Richmond, Va.....	C. Call, N. Wilkesboro, N. C.....	*84.27	11.14	4.59	91.5
6274	do.....	do.....	Hazell & Minus, Reidsville, N. C.....	91.75	8.05	.20	93.3
6392	do.....	do.....	George Moose, Newton, N. C.....	89.98	9.75	.27	90.5

2786	do.	do.	Mt. Airy Feed Store, Mt. Airy, N. C.	*83.69	11.49	4.82	79.5
6062	do.	do.	do.	*79.18	14.87	5.95	80.0
6273	do.	do.	do.	*69.38	18.26	12.46	93.0
6498	do.	do.	Wm. G. Scarlett & Co., Baltimore, Md.	*83.15	16.12	.73	87.5
2808	do.	do.	T. W. Wood & Sons, Richmond, Va.	95.74	3.83	.43	76.3
6058	do.	do.	Carolina Warehouse, Greensboro, N. C.	93.80	4.26	1.94	86.3
6191	do.	do.	Cline & Moose, Concord, N. C.	95.25	4.28	.47	89.3
6495	do.	do.	Farmers Hardware & Supply Co., Hendersonville, N. C.	*82.59	16.54	.87	87.5
6057	do.	do.	Farmers Union Agency Co., Winston-Salem, N. C.	95.09	4.72	.19	87.8
6090	do.	do.	Gaston Seed and Prov. Co., Gastonia, N. C.	95.28	4.13	.59	85.0
6393	do.	do.	do.	*78.20	18.92	2.88	89.5
6056	do.	do.	W. A. Leslie, Morganton, N. C.	95.44	4.00	.56	81.8
6207	do.	do.	W. M. Neel & Co., Mooresville, N. C.	95.83	3.61	.56	85.5
6059	do.	do.	S. L. Owen & Co., Lexington, N. C.	95.72	3.90	.38	88.3
6538	do.	do.	Sylva Supply Co., Sylva, N. C.	90.28	9.53	.19	95.0
6192	do.	do.	Union Warehouse, Salisbury, N. C.	95.94	3.48	.58	86.0
6163	do.	do.	Wilkins, Ricks & Co., Sanford, N. C.	95.30	4.41	.29	86.5
6496	do.	do.	T. S. Morrison & Co., Asheville, N. C.	*78.45	7.55	14.00	90.0
6497	do.	do.	Slayden, Fakes & Co., Asheville, N. C.	*71.60	13.80	14.60	88.5
6030	Rye	Adams Grain & Prov. Co., Norfolk, Va.	R. E. Campbell, Shelby, N. C.	*95.05	2.80	1.55	162.5
6029	do.	do.	W. B. Palmers' Sons, Shelby, N. C.	*95.18	3.37	1.45	174.0
6135	do.	Adams Grain & Prov. Co., Richmond, Va.	J. H. Boone & Son, Benson, N. C.	*95.36	2.96	1.08	180.5
6028†	do.	do.	Farmers Union Agency Co., Winston-Salem, N. C.				
6136	do.	do.	Mt. Gilead Store Co., Mt. Gilead, N. C.	*93.75	4.34	1.91	175.0

(Cheat.)

TABLE XII.—RESULTS OF TESTS OF 28 KINDS OF AGRICULTURAL SEEDS, 727 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913 TO JULY 15, 1914—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Pure Seed of Per Cent of	Inert Matter of Per Cent of	Foreign Seed of Per Cent of	Per Cent of Germination
6138	RYE ( <i>Cheat, Wild mustard</i> )	S. T. Beveridge & Co., Richmond, Va.	Austin-Stephens Co., Smithfield, N. C.	*95.88	3.31	.81	†71.5
2899	do.	do.	Bellamy & Co., Enfield, N. C.	*93.04	6.79	.17	†87.5
2897	do.	do.	H. L. Bizzell, Goldsboro, N. C.	*97.01	1.97	1.02	†69.5
6137	do.	do.	N. S. Blue & Co., Racford, N. C.	*95.09	3.24	1.67	†79.0
6025	do.	do.	R. E. Campbell, Shelby, N. C.	*86.77	1.67	1.56	†65.0
6186	do.	do.	Cline & Moose, Concord, N. C.	*96.05	2.88	1.07	†55.5
2983	do.	do.	J. T. Edgerton, Kenly, N. C.	*94.97	4.82	.21	†72.0
2898	do.	do.	Z. M. L. Jeffreys, Goldsboro, N. C.	*96.10	3.44	.46	†73.5
6024	do.	do.	H. E. Kendall, Shelby, N. C.	*97.28	1.97	.75	†58.5
2904	do.	do.	Parham Supply Co., Henderson, N. C.	*94.76	4.10	.84	†88.0
6023	do.	do.	C. Scott & Co., Greensboro, N. C.	*95.26	4.31	.43	†88.0
6352	do.	do.	Wallace Grocery Co., Wallace, N. C.	*95.32	4.36	.32	91.0
2896	do.	do.	W. T. Williford, Rocky Mount, N. C.	*95.01	4.31	.68	†72.0
2984	do.	Carter, Venable & Co., Richmond, Va.	J. C. Bryan & Co., Parmele, N. C.	*94.81	2.42	2.77	†86.0
2935	do.	do.	Gray & Roebuck, Parmele, N. C.	*94.60	4.11	1.26	†89.0
2933	do.	do.	H. W. & J. C. Webb, Hillsboro, N. C.	*96.00	3.52	.48	†85.5
2982	do.	do.	Winston-Long Co., Oxford, N. C.	*95.38	3.59	1.03	†84.0
2903	do.	Diggs & Beadles, Richmond, Va.	The Beacon Supply Co., Henderson, N. C.	*96.21	3.04	.75	†72.0
2946	do.	do.	Byrd & Upehureh, Durham, N. C.	*95.33	3.78	.89	†82.0

2947	do..... ( <i>Cheat.</i> )	do.....	Homer Bros., Oxford, N. C.....	*93.79	3.55	2.66	175.0
2902	do..... ( <i>Cheat.</i> )	do.....	Wilson Grocery Co., Wilson, N. C.....	*92.73	3.31	3.96	187.0
2894	do..... ( <i>Cheat.</i> )	Mayo Milling Co., Richmond, Va.....	Dozier & Griffin, Rocky Mount, N. C.....	*95.87	3.36	.77	188.5
2980	do..... ( <i>Cheat.</i> )	do.....	J. R. & J. G. Moyes, Greenville, N. C.....	*94.01	3.87	2.12	170.0
6134†	do..... ( <i>Wild mustard, Quack grass, Wild oats.</i> )	do.....	W. N. Stewart, Benson, N. C.....				
2895	do..... ( <i>Cheat.</i> )	do.....	W. T. Williford, Rocky Mount, N. C.....	*96.57	2.82	.61	93.5
2979	do..... ( <i>Cheat.</i> )	Geo. Moose, Newton, N. C.....	A. E. Rankin & Co., Fayetteville, N. C.....	*97.27	2.34	.39	93.0
6131	do..... ( <i>Cheat.</i> )	W. F. Richardson, Jr., & Co., Richmond, Va.....	Johnston Brothers, Charlotte, N. C.....	*95.66	2.36	1.98	188.5
2944	do..... ( <i>Cheat.</i> )	do.....	McKinne Bros. Co., Louisville, N. C.....	*92.46	6.35	1.19	184.0
2945	do..... ( <i>Cheat.</i> )	do.....	J. T. Rogers & Co., Durham, N. C.....	*93.13	5.97	.90	89.5
2905	do..... ( <i>Cheat.</i> )	Roper & Co., Petersburg, Va.....	W. T. Parker, Weldon, N. C.....	*94.84	4.73	.43	186.5
2949	do..... ( <i>Cheat.</i> )	N. R. Savage & Son, Richmond, Va.....	J. D. Brooks, Oxford, N. C.....	*89.03	2.91	8.06	159.5
2950	do..... ( <i>Cheat.</i> )	do.....	Carlton-Hackney Drug Co., Durham, N. C.....	*95.42	4.11	.47	186.0
6140	do..... ( <i>Cheat.</i> )	do.....	Carter-Underwood Co., Smithfield, N. C.....	*95.21	4.17	.62	176.0
2982	do..... ( <i>Cheat, Wild mustard.</i> )	do.....	Ray Dawson, Kinston, N. C.....	*95.25	3.23	1.52	124.5
2981	do..... ( <i>Cheat.</i> )	do.....	G. G. Edgerton & Son, Kenly, N. C.....	*94.48	5.29	.23	89.5
2948	do..... ( <i>Cheat.</i> )	do.....	J. W. & D. S. Fuller, Oxford, N. C.....	*96.45	2.82	.73	183.0
6187	do..... ( <i>Cheat.</i> )	do.....	H. L. Parks & Co., Concord, N. C.....	*95.93	3.32	.75	89.5
2951	do..... ( <i>Cheat.</i> )	do.....	Geo. A. Rose & Co., Henderson, N. C.....	98.61	.88	.51	165.5
6139	do..... ( <i>Cheat.</i> )	do.....	W. M. Sanders, Smithfield, N. C.....	*90.37	3.92	5.71	129.5
2986	do..... ( <i>Cheat.</i> )	W. A. Simpson & Co., Baltimore, Md.....	W. J. Newsom & Bro., Lacama, N. C.....	98.17	1.19	.64	94.5
6027	do..... ( <i>Cheat.</i> )	W. R. Tate, Nashville, Tenn.....	Paul Webb, Shelby, N. C.....	97.96	.88	1.16	91.0
6189	do..... ( <i>Cheat.</i> )	T. W. Wood & Sons, Richmond, Va.....	Gaston Seed & Prov. Co., Gastonia, N. C.....	*94.82	4.34	.84	187.5
2943	do..... ( <i>Cheat.</i> )	do.....	Haywood & Boone, Durham, N. C.....	*96.39	2.14	1.47	149.0
2978†	do..... ( <i>Cheat.</i> )	do.....	A. S. Huske, Fayetteville, N. C.....				

TABLE XII.—RESULTS OF TESTS OF 28 KINDS OF AGRICULTURAL SEEDS, 727 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913 TO JULY 15, 1914—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Pure Seed Per Cent of	Inert Matter Per Cent of	Per Cent of Foreign Seed	Per Cent of Germination
2000	RYE..... ( <i>Cheat.</i> )	T. W. Wood & Sons, Richmond, Va.....	B. D. Mann, Enfield, N. C.....	*93.53	5.54	.63	†88.0
6022	do..... ( <i>Cheat.</i> )	do.....	S. L. Owen & Co., Lexington, N. C.....	*94.32	4.98	.70	†86.5
6188	do..... ( <i>Cheat.</i> )	do.....	M. C. Ruffy, Salisbury, N. C.....	*85.86	3.66	.48	†82.5
6134	do..... ( <i>Cheat.</i> )	do.....	W. S. Russell, Gulf, N. C.....				
6132	do..... ( <i>Cheat.</i> )	do.....	Lee Stone & Co., Sanford, N. C.....	*93.74	5.83	.43	†86.0
6021	do..... ( <i>Cheat.</i> )	do.....	W. P. Ware, Reidsville, N. C.....	*93.87	5.48	.65	†81.0
6026	do..... ( <i>Corn cockle.</i> )	do.....	Paul Webb, Shelby, N. C.....	*93.77	5.99	.24	†81.0
2901	do..... ( <i>Cheat.</i> )	do.....	R. S. Wells, Elm City, N. C.....	*95.70	4.11	.19	†59.0
6533	Timothy.....	S. T. Beveridge & Co., Richmond, Va.....	J. H. Ditmore, Bryson City, N. C.....	98.88	.92	.20	94.5
6535	do.....	J. Bolgiano & Son, Baltimore, Md.....	Chautauqua Drug Co., Waynesville, N. C.....	98.90	.96	.24	90.5
6251	do.....	J. J. Buffington & Co., Baltimore, Md.....	T. P. Nash, Elizabeth City, N. C.....	98.99	.67	.34	†69.3
6570	do.....	do.....	W. S. White & Co., Elizabeth City, N. C.....	98.61	.96	.43	91.5
6536	do.....	Hackney, Broyles & Lackey Co., Knoxville, Tenn.....	R. H. Hyatt & Co., Murphy, N. C.....	99.34	.56	.10	88.8
6073	do.....	Hardin, Hamilton & Lewman, Louisv., Ky.....	C. Scott & Co., Greensboro, N. C.....	98.67	.61	.69	96.8
6072	do.....	N. R. Savage & Son, Richmond, Va.....	G. Call, N. Wilkesboro, N. C.....	99.23	.48	.29	91.8
6293	do.....	do.....	Miller Grocery Co., Wilkesboro, N. C.....	98.43	1.28	.29	90.0
6070	do.....	do.....	Geo. Moose, Newton, N. C.....	99.36	.49	.15	93.8
6402	do.....	do.....	do.....	98.95	.81	.24	93.5
6071	do.....	do.....	Mt. Airy Feed Store, Mt. Airy, N. C.....	97.10	1.81	1.09	†81.8

6240	do	Slate Seed Co., South Boston, Va.	A. S. Huske, Fayetteville, N. C.	99.03	.37	.60	92.8
6077	do	T. W. Wood & Sons, Richmond, Va.	Beeson Hardware Co., High Point, N. C.	98.42	.59	.99	94.0
2972	do	do	Carlton-Hackney Drug Co., Durham, N. C.	99.63	.28	.69	88.3
6074	do	do	Carolina Warehouse, Greensboro, N. C.	99.27	.59	.14	93.3
6185	do	do	Cline & Moose, Concord, N. C.	99.17	.19	.64	94.8
6158	do	do	Davidson & Wolfe, Charlotte, N. C.	98.74	.34	.92	86.3
6489	do	do	Farmers Hardware & Supply Co., Hendersonville, N. C.	99.53	.33	.14	88.3
6075	do	do	Farmers Union Agency Co., Winston-Salem, N. C.	99.08	.34	.58	94.0
6183	do	do	Gaston Seed & Prov. Co., Gastonia, N. C.	95.59	1.16	3.25	184.3
6213	do	do	Miller, McLean Supply Co., Statesville, N. C.	99.19	.24	.57	95.5
6076	do	do	S. L. Owen & Co., Lexington, N. C.	99.37	.48	.15	94.5
6534	do	do	Sylva Supply Co., Sylva, N. C.	99.34	.42	.24	90.5
6184	do	do	Union Warehouse, Salisbury, N. C.	99.12	.24	.64	93.0
6159	do	do	Wilkins, Ricks & Co., Sanford, N. C.	98.89	.53	.58	96.3
6487	do	do	Grant Pharmacy, Asheville, N. C.	99.21	.51	.28	183.5
6488	do	do	T. S. Morrison & Co., Asheville, N. C.	98.06	1.26	.68	89.5
6486	do	do	Slayden, Fakes & Co., Asheville, N. C.	98.45	.48	.57	90.5
6065	VECH, WINTER (Corn cockle.)	S. T. Beveridge & Co., Richmond, Va.	Harrison & Co., Lenoir, N. C.	93.80	.90	.30	65.5
2967	do	J. Bolgiano & Son, Baltimore, Md.	H. W. & J. C. Webb, Hillsboro, N. C.	92.43	.12	7.45	33.0
2911	do	Diggs & Beadles, Richmond, Va.	Hadley-Harris Co., Wilson, N. C.	93.69	.15	1.16	66.0
2994	do	do	A. S. Huske, Fayetteville, N. C.	99.58	.42		37.5
6064	do	do	Carolina Warehouse, Greensboro, N. C.	99.21	.31	.48	69.5
6063	do	do	City Feed Co., Hickory, N. C.	99.30	.68	.02	72.0
6151	do	do	Parson Drug Co., Wadesboro, N. C.	99.54	.33	.13	78.0
6145	do	T. W. Wood & Sons, Richmond, Va.	G. W. Allen & Son, Troy, N. C.	99.59	.41		17.0

TABLE XII.—RESULTS OF TESTS OF 28 KINDS OF AGRICULTURAL SEEDS, 727 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913 TO JULY 15, 1914—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Pure Cent of Seed	Per Cent of Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
6404	VETCH, WINTER.....	T. W. Wood & Sons, Richmond, Va.....	J. B. Barnes, Taylorsville, N. C.....	93.23	.10	1.67	40.5
6067	do ( <i>Corn cockle</i> .)	do.....	Beeson Hardware Co., High Point, N. C.....	99.36	.25	.39	39.0
6148	do.....	do.....	Bridgers & Co., Charlotte, N. C.....	100.00			21.5
6146	do.....	do.....	A. W. E. Capel, Troy, N. C.....	99.72	.12	.16	36.0
6147	do.....	do.....	Farmers Supply Co., Charlotte, N. C.....	99.08	.12	.80	37.5
6182	do.....	do.....	Gaston Seed & Prov. Co., Gastonia, N. C.....	99.00	.15	.85	26.5
2968	do.....	do.....	Jos. A. Iseley & Bro., Burlington, N. C.....	99.05	.07	.88	28.5
2993	do.....	do.....	Lucas & Bass Co., Lucama, N. C.....	99.94		.06	27.0
6149	do.....	do.....	J. A. McAuley, Mt. Gilead, N. C.....	98.58	.32	1.10	48.0
6180	do ( <i>Corn cockle</i> .)	do.....	W. A. Mauney & Bro., Kings Mountain, N. C.....	96.58	.41	3.01	26.5
6215	do ( <i>Corn cockle</i> .)	do.....	Miller-McLean Supply Co., Statesville, N. C.....	98.94		1.06	31.0
6066	do.....	do.....	S. L. Owen & Co., Lexington, N. C.....	99.23	.07	.70	31.0
6181	do ( <i>Corn cockle</i> .)	do.....	Patterson Grocery Co., Kings Mountain, N. C.....	97.84	.08	2.08	40.0
6179	do.....	do.....	M. C. Ruffy, Salisbury, N. C.....	99.84	.10	.06	33.0
6068	do.....	do.....	C. Scott & Co., Greensboro, N. C.....	99.54	.09	.37	37.5
2772	do ( <i>Corn cockle</i> .)	do.....	Spence & Hollowell, Elizabeth City, N. C.....	97.13	.07	2.62	30.0
6150	do.....	do.....	Wilkins, Ricks & Co., Sanford, N. C.....	99.54	.10	.36	38.0

6069	.....do..... ( <i>Corn cockle</i> .)	Imported seed.....	Hickory Seed Co., Hickory, N. C.....	93.04	.57	6.39	57.5
2906	WHEAT.....	N. R. Savage & Son, Richmond, Va.....	E. G. Davis Son & Co., Henderson, N. C..	98.65	1.28	.07	177.0
6109	.....do..... ( <i>Corn cockle</i> .)	Locally grown.....	Hickory Seed Co., Hickory, N. C.....	99.56	.39	.05	180.5

\*Below standard for purity. †Below standard for germination. ‡Sample examined for unlawful seeds; too weevil-eaten to make regular test.





TABLE XIV.—THE ADULTERATION OF AGRICULTURAL SEEDS.

Laboratory Number	Kind of Seed and Number of Samples Tested	Wholesale Dealer	Retail Dealer	Adulterant	Per Cent of Adulteration
2971	ALFALFA, 14	Diggs & Beadles, Richmond, Va.	C. E. King & Sons, Durham, N. C.	Red clover.	5
6258	BLUE GRASS, Ky., 21	T. W. Wood & Sons, Richmond, Va.	Farmers Supply Co., Charlotte, N. C.	Canada bluegrass.	11
6527	GRASS, ORCHARD, 44	Hackney, Broyles & Lackey Co., Knoxville, Tenn.	R. H. Hyatt & Co., Murphy, N. C.	Italian rye grass.	8
6205	OATGRASS, TALL, 11	T. W. Wood & Sons, Richmond, Va.	Gaston Seed & Provision Co., Gastonia, N. C.	Orchard grass	8
6394	do.	do.	do.	do.	13
6433	OATS, 187	Roper & Co., Petersburg, Va.	J. W. & D. S. Fuller, Oxford, N. C.	Rye.	6
6253	REDTOP, 33	J. J. Buffington & Co., Baltimore, Md.	T. P. Nash, Elizabeth City, N. C.	Timothy.	31
6574	do.	do.	do.	do.	32
6537	do.	Hackney, Broyles & Lackey Co., Knoxville, Tenn.	R. H. Hyatt & Co., Murphy, N. C.	do.	7
6062	do.	N. R. Savage & Son, Richmond, Va.	Mt. Airy Feed Store, Mt. Airy, N. C.	do.	5
6273	do.	do.	do.	do.	11
6496	do.	do.	T. S. Morrison & Co., Asheville, N. C.	do.	14
6497	do.	do.	Slayden, Fakes & Co., Asheville, N. C.	do.	14
2949	RYE, 57	do.	J. D. Brooks, Oxford, N. C.	Wheat.	7
6139	do.	do.	W. M. Sanders, Smithfield, N. C.	do.	5
2967	VETCH, WINTER, 26	J. Bolgiano & Son, Baltimore, Md.	H. W. & J. C. Webb, Hillsboro, N. C.	Spring Vetch.	7
6069	do.	Imported Seed	Hickory Seed Co., Hickory, N. C.	do.	6

NOTE.—The above table shows 17 cases of adulteration which were found in the 727 agricultural seed samples collected by inspectors. No case is reported where an adulterant was not present to the amount of five (5) per cent.

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 807 SAMPLES IN ALL, COLLECTED BY INSPECTORS  
FROM JULY 15, 1913, TO JULY 15, 1914.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
3350	BEANS.....	W. W. Barnard & Co., Chicago, Ill.....	W. J. Kirkham & Co., Wilmington, N. C.....	100.0
3351	do.....	do.....	do.....	99.0
3354	do.....	do.....	S. W. Willis, New Bern, N. C.....	95.0
3391	do.....	Robert Buist Co, Philadelphia, Pa.....	R. R. Bellamy, Wilmington, N. C.....	100.0
3357	do.....	do.....	W. A. & J. G. Blount, Washington, N. C.....	18.0
3998	do.....	do.....	S. F. Brown & Co., High Point, N. C.....	60.0
3484	do.....	do.....	R. E. L. Cook, Tarboro, N. C.....	94.0
3485	do.....	do.....	do.....	5.0
4158	do.....	do.....	do.....	78.0
4159	do.....	do.....	do.....	76.0
4160	do.....	do.....	do.....	86.0
4161	do.....	do.....	do.....	98.0
4186	do.....	do.....	Davis Pharmacy, Marion, N. C.....	69.0
3793	do.....	do.....	Fox & Lyon, Wadesboro, N. C.....	99.0
3791	do.....	do.....	W. L. Hond & Co., Charlotte, N. C.....	99.0
3792	do.....	do.....	do.....	93.0
4208	do.....	do.....	Hood & Grantham, Dunn, N. C.....	58.0
4059	do.....	do.....	M. R. Jennett, Mount Olive, N. C.....	70.0
3702	do.....	do.....	T. C. Joyner, Franklinton, N. C.....	94.5

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 867 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913, TO JULY 15, 1914.—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
1269	BEANS	R. de v. Bui & Co., Philadelphia, Pa.	W. A. Leggett, Edenton, N. C.	98.0
3599	do	do	May & Gorman, Rocky Mount, N. C.	93.0
3894	do	do	Parson Drug Co., Wadesboro, N. C.	93.5
3895	do	do	do	98.0
4060	do	do	J. C. Peterson, Clinton, N. C.	88.0
3481	do	do	Saunders & Fowden, Williamston, N. C.	98.0
3482	do	do	do	72.0
3603	do	do	Temple Drug Co., Kinston, N. C.	86.0
3607	do	do	do	96.0
3725	do	W. Atlee Burpee & Co., Philadelphia, Pa.	Hunter Drug Co., Warrenton, N. C.	79.0
3932	do	Everett B. Clark Seed Co., Milford, Conn.	R. R. Bellamy, Wilmington, N. C.	93.0
3933	do	do	do	91.0
3934	do	do	do	99.0
3935	do	do	S. W. Willis, New Bern, N. C.	97.0
3717	do	Crosman Bros. Co., Rochester, N. Y.	E. T. Alford, Youngsville, N. C.	99.0
3778	do	do	Barnes Bros., Proctorville, N. C.	9.0
3852	do	do	E. L. Barnes, Maxton, N. C.	100.0
3679	do	do	E. Clarke, Weldon, N. C.	78.0
3723	do	do	Wells Dillery, Roanoke Rapids, N. C.	68.0

3724	do	do	do	do	97.0
4000	do	do	do	Harris & Hubbard, Reidsville, N. C.	100.0
3838	do	do	do	E. C. Kirk, Albemarle, N. C.	100.0
4167	do	do	do	C. R. L. Matthews, Rocky Mount, N. C.	93.0
3999	do	do	do	W. F. Midkiff, Mount Airy, N. C.	100.0
3773	do	do	do	Taylor & Cowan, Jackson, N. C.	77.5
3678	do	do	do	G. T. Whitehead & Co., Scotland Neck, N. C.	100.0
3748	do	do	do	L. Thomas, Oxford, N. C.	13.0
3928	do	do	Diggs & Beadles, Richmond, Va.	H. L. Arnold, Vanceboro, N. C.	82.0
3792	do	do	do	D. M. Ferry & Co., Detroit, Mich.	8.0
3763	do	do	do	Burroughs Grocery Co., Warrenton, N. C.	63.0
4193	do	do	do	Buthers Lumber Co., Boardman, N. C.	100.0
3231	do	do	do	W. G. Cole, Canton, N. C.	46.0
3922	do	do	do	A. J. Cook & Co., Fayetteville, N. C.	79.5
3444	do	do	do	Walter Credle & Co., Washington, N. C.	98.0
3738	do	do	do	B. B. Davenport, New Bern, N. C.	99.1
3594	do	do	do	S. J. Dilday, Ahoskie, N. C.	100.0
3701	do	do	do	Fitzgerald Drug Co., Rocky Mount, N. C.	69.0
3667	do	do	do	Franklin Grocery Co., Franklinton, N. C.	100.0
3388	do	do	do	Harrison & Hill Drug Co., Enfield, N. C.	61.0
3814	do	do	do	F. V. Johnston, Greenville, N. C.	99.0
3418	do	do	do	Kiser & Mauncy, Kings Mountain, N. C.	75.0
3438	do	do	do	J. B. Morton, Morehead City, N. C.	97.0
3400	do	do	do	Porter Bros., Beaufort, N. C.	84.0
3406	do	do	do	J. H. Roberson & Co., Robersonville, N. C.	66.0
3255	do	do	do	Theo. Roberson & Co., Williamston, N. C.	79.0
				Robinson Bros., Dunn, N. C.	

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 807 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913, TO JULY 15, 1914.—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
3394	BEANS	D. M. Ferry & Co., Detroit, Mich.	Robinson-Ruffin Co., Tarboro, N. C.	37.0
3243	do	do	W. M. Sanders, Smithfield, N. C.	59.0
3249	do	do	Selma Drug Co., Selma, N. C.	58.0
3744	do	do	J. T. Sizemore, Oxford, N. C.	42.0
3237	do	do	W. F. Smith, Benson, N. C.	75.0
3412	do	do	Henry L. Spruill, Plymouth, N. C.	99.0
3456	do	do	D. W. Forb, Roseboro, N. C.	54.0
3450	do	do	G. T. Walton, Jacksonville, N. C.	55.0
4074	do	do	T. N. Waters & Bros., Goldsboro, N. C.	99.0
3382	do	do	Watson & Winslow, Hertford, N. C.	92.0
3423	do	do	E. K. Willis, Washington, N. C.	100.0
3673	do	do	J. D. Winstead & Son, Nashville, N. C.	83.0
3801	do	Griffith & Turner, Baltimore, Md.	Red Springs Drug Co., Red Springs, N. C.	66.0
3802	do	do	do	56.0
3853	do	Lake Shore Seed Co., Dunkirk, N. Y.	Adams Drug Co., Gastonia, N. C.	77.5
4106	do	do	W. C. Asbury, Lincolnton, N. C.	96.0
3345	do	do	J. F. Clarke, New Bern, N. C.	97.5
3510	do	do	Divers & Roper, Hertford, N. C.	92.5
3266	do	do	J. B. Fields, Fayetteville, N. C.	97.5

3828	do	do	Hamlet Pharmacy, Hamlet, N. C.	62.0
3858	do	do	A. L. Jones, Maxton, N. C.	92.5
3864	do	do	Martin & Price Co., Mt. Olive, N. C.	95.0
3829	do	do	E. S. Mewborn, La Grange, N. C.	65.0
4040	do	do	Murray & Armstrong, Wallace, N. C.	44.0
4035	do	do	E. E. Rouse & Co., La Grange, N. C.	98.0
4050	do	do	Sing-story Drug Co., Burgaw, N. C.	60.0
3370	do	do	Tom L. Smith, Plymouth, N. C.	94.0
3624	do	do	H. S. Southerland, Clinton, N. C.	90.0
3505	do	do	J. L. Stashey, Greenville, N. C.	27.5
3799	do	do	W. F. Tarlton, Wadesboro, N. C.	99.0
3339	do	do	D. W. Tart, Roseboro, N. C.	70.0
4046	do	do	W. D. Thomas & Co., Warsaw, N. C.	71.0
3500	do	do	W. S. White, Edenton, N. C.	87.5
3353	do	D. Landreth Seed Co., Bristol, Pa.	Beaufort Drug Co., Beaufort, N. C.	60.0
3429	do	do	do	96.0
4187	do	do	Brevard Hardware Co., Brevard, N. C.	99.0
3613	do	do	Henry Dunn, Kinston, N. C.	100.0
3614	do	do	do	100.0
4188	do	do	Grant's Pharmacy, Asheville, N. C.	100.0
3618	do	do	D. M. Partrick & Co., Clinton, N. C.	68.0
4110	do	do	J. H. Rudisill & Co., Lincolnton, N. C.	100.0
4111	do	do	do	99.5
3800	do	do	C. N. Simpson, Jr., Monroe, N. C.	95.0
4075	do	do	Temple Drug Co., Kinston, N. C.	96.0
3690	do	do	Thomas Bros., Henderson, N. C.	78.0

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 807 SAMPLES IN ALL, COLLECTED BY INSPECTORS  
FROM JULY 15, 1914, TO JULY 15, 1914.—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
4165	BEANS	D. Landreth Seed Co., Bristol, Pa.	Thomas Bros., Henderson, N. C.	99.0
4166	do.	do.	do.	78.0
4164	do.	do.	Wilson Drug Co., Wilson, N. C.	92.0
3360	do.	Leonard Seed Co., Chicago, Ill.	R. R. Ballamy, Wilmington, N. C.	70.0
4071	do.	do.	M. J. Best & Son, Goldsboro, N. C.	97.0
3786	do.	do.	Charlotte Drug Co., Charlotte, N. C.	68.0
3787	do.	do.	do.	75.0
3788	do.	do.	do.	47.5
3608	do.	do.	J. E. Hood & Co., Kinston, N. C.	43.0
4068	do.	do.	do.	98.0
4069	do.	do.	do.	96.0
3270	do.	do.	A. S. Huske, Fayetteville, N. C.	25.0
3359	do.	do.	W. J. Kirkham & Co., Wilmington, N. C.	76.0
4072	do.	do.	T. H. Knowles & Co., Mt. Olive, N. C.	100.0
3636	do.	do.	Mt. Olive Grocery & Hardware Co., Mt. Olive, N. C.	79.0
4210	do.	do.	Ruffin-High Co., Wilson, N. C.	82.0
3997	do.	do.	C. Scott & Co., Greensboro, N. C.	100.0
4070	do.	do.	B. G. Thompson & Son, Goldsboro, N. C.	90.0
4073	do.	do.	T. N. Waters & Bros., Goldsboro, N. C.	100.0

3524	do	do	W. S. White & Co., Elizabeth City, N. C.	23.0
3358	do	do	Worthy & Etheridge, Washington, N. C.	73.0
3361	do	do	Worthy & Etheridge, Washington, N. C.	75.0
4107	do	L. L. May & Co., St. Paul, Minn.	W. C. Asbury, Lincoln, N. C.	73.0
4108	do	do	Clarence Clapp, Newton, N. C.	62.0
4109	do	do	do	54.0
3375	do	do	Divers & Roper, Hertford, N. C.	13.0
3703	do	do	F. R. Pleasants, Louisburg, N. C.	93.0
3815	do	do	E. D. Whitlocke, Rockingham, N. C.	54.0
3940	do	J. B. Riro Seed Co., Cambridge, N. Y.	Blount Pharmacy, Washington N. C.	76.0
3356	do	do	J. F. Clarke, New Bern, N. C.	81.0
3945	do	do	do	97.0
3946	do	do	do	81.0
3947	do	do	do	84.0
3582	do	do	Geo. E. Daniels, Goldsboro, N. C.	95.0
4203	do	do	do	96.0
4204	do	do	do	100.0
3355	do	do	F. S. Duffy, New Bern N. C.	99.0
3941	do	do	do	82.0
3942	do	do	do	79.0
3929	do	do	J. H. Hardin, Wilmington, N. C.	95.0
3936	do	do	do	99.0
3937	do	do	do	82.0
3938	do	do	do	99.0
3939	do	do	do	99.0
4063	do	do	C. Harrell & Son, Burgaw, N. C.	81.0

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 397 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913, TO JULY 15, 1914.—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
4064	BEANS	J. B. Rice Seed Co., Cambridge, N. Y.	C. Harrell & Son, Burgaw, N. C.	81.0
3896	do	do	A. S. Huske, Fayetteville, N. C.	68.0
3897	do	do	A. S. Huske, Fayetteville, N. C.	91.0
4205	do	do	do	97.0
4062	do	do	Z. M. L. Jeffreys, Goldsboro, N. C.	96.0
3635	do	do	Y. H. Knowles & Co., Mt. Olive, N. C.	51.0
4182	do	do	Leslie Drug Store, Morganton, N. C.	100.0
4183	do	do	do	86.0
3691	do	do	W. W. Parker, Henderson, N. C.	94.0
4156	do	do	do	92.0
4157	do	do	do	99.0
4160	do	do	J. C. Peterson, Clinton, N. C.	100.0
4001	do	do	C. Scott & Co., Greensboro, N. C.	84.5
3585	do	do	T. N. Waters & Bro., Goldsboro, N. C.	95.0
3523	do	do	W. S. White & Co., Elizabeth City, N. C.	96.0
3930	do	do	do	100.0
3943	do	do	do	95.0
3944	do	do	do	75.0

3948	do	Wood-Stubbs & Co., Louisville, Ky.	Brown Mercantile Co., Chadbourne, N. C.	96.0
3949	do	do	do	96.0
4206	do	do	A. J. Cox & Co., Washington, N. C.	94.0
4207	do	do	H. C. Joyner, Rocky Mount, N. C.	100.0
4076	do	do	M. W. Pope, Mt. Olive, N. C.	100.0
4077	do	do	do	100.0
4162	do	do	Tarboro Grocery Co., Tarboro, N. C.	97.0
3805	do	T. W. Wood & Sons, Richmond, Va.	Barnes-Finger Drug Co., Kings Mountain, N. C.	39.0
3907	do	do	W. H. Bowen & Son, Belhaven, N. C.	96.0
4185	do	do	Bradsher's Pharmacy, Hendersonville, N. C.	92.5
3953	do	do	H. A. Chadwick, Pollocksville, N. C.	87.0
4194	do	do	Chautauqua Drug Co., Waynesville, N. C.	33.0
3816	do	do	E. N. Covington & Co., Rockingham, N. C.	100.0
3817	do	do	do	94.0
3685	do	do	Ferguson Drug Co., Halifax, N. C.	15.0
3863	do	do	Harris Bros., Waxhaw, N. C.	93.0
4065	do	do	J. C. Horne, Magnolia, N. C.	40.0
3271	do	do	A. S. Huske, Fayetteville, N. C.	19.0
4066	do	do	J. B. Johnston, Greenville, N. C.	98.0
4067	do	do	do	84.0
4112	do	do	H. E. Kendall, Shelby, N. C.	100.0
4184	do	do	L. A. Kincaid, Morganton, N. C.	95.0
3952	do	do	W. J. Kirkham & Co., Wiluington, N. C.	92.0
3615	do	do	Lenoir Drug Co., Kinston, N. C.	28.5
4007	do	do	Mann Drug Co., High Point, N. C.	41.5
4008	do	do	Miller Grocery Co., Wilkesboro, N. C.	42.5

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 807 SAMPLES IN ALL, COLLECTED BY INSPECTORS  
FROM JULY 15, 1913, TO JULY 15, 1914.—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
3396	BEANS	T. W. Wood & Sons, Richmond, Va.	Mitchell & Barrow, Star, N. C.	94.5
3494	do.	do.	J. A. Mitchener, Edenton, N. C.	10.0
3495	do.	do.	do.	90.0
3823	do.	do.	E. L. Rhodes, Hamlet, N. C.	100.0
3351	do.	do.	M. R. Springle, Beaufort, N. C.	23.0
3352	do.	do.	do.	73.0
3818	do.	do.	R. G. Stone, Laurinburg, N. C.	35.0
3616	do.	do.	J. D. Williams, Wilson, N. C.	58.0
4163	do.	do.	Wilson Drug Co., Wilson, N. C.	64.0
3975	BEETS	W. W. Barnard & Co., Chicago, Ill.	W. J. Kirkham & Co., Wilmington, N. C.	81.0
4096	do.	do.	T. W. Waters & Bro., Goldsboro, N. C.	63.0
4004	do.	Robert Buist Co., Philadelphia, Pa.	S. F. Brown & Co., High Point, N. C.	64.5
4189	do.	do.	Davis Pharmacy Marion, N. C.	72.5
4190	do.	do.	do.	85.0
4056	do.	do.	E. B. Marston Drug Co., Kinston, N. C.	87.5
4130	do.	W. Atlee Burpee & Co., Philadelphia, Pa.	Hunter Drug Co., Warrenton, N. C.	78.0
4010	do.	Cresnan Bros. Co., Rochester, N. Y.	J. J. Adams Sons & Co., Winston-Salem, N. C.	92.0
3713	do.	do.	E. T. Alford, Youngsville, N. C.	87.0
4149	do.	do.	E. S. Barrett & Co., Jackson, N. C.	

4027	do	F. Barwick, La Grange, N. C.	83.5
3845	do	Hart Drug Co., Norwood, N. C.	43.5
3835	do	Kennedy's Drug Store, Gastonia, N. C.	28.0
3811	do	Kiser & Mauney, Kings Mountain, N. C.	24.5
3693	do	W. W. Parker, Henderson, N. C.	77.5
4015	do	F. D. Scott & Son, Magnolia, N. C.	89.5
3840	do	Shankle, Snuggs Co., Albemarle, N. C.	69.5
4152	do	Herbert Smith, Littleton, N. C.	85.5
3675	do	G. T. Whitehead & Co., Scotland Neck, N. C.	82.5
4023	do	J. D. Williams, Wilson, N. C.	90.0
4019	do	W. A. Wilson, Dover, N. C.	75.5
4098	do	Armour Bros. & Thompson, Davilson, N. C.	79.5
3924	do	H. L. Arnold, Vanceboro, N. C.	79.0
3879	do	U. A. Bell & Co., Dunn, N. C.	84.0
3982	do	Bruton & Co., Mt. Gilead, N. C.	75.5
3728	do	Burroughs Grocery Co., Warrenton, N. C.	80.5
3759	do	Buthers Lumber Co., Boardman, N. C.	71.5
3910	do	H. A. Chadwick, Pollocksville, N. C.	71.5
3440	do	B. B. Davenport, New Bern, N. C.	78.5
3590	do	Fitzgerald Drug Co., Rocky Mount, N. C.	77.0
4137	do	Hill Bros., Cofield, N. C.	74.0
4145	do	J. J. Madre & Bros., Windsor, N. C.	73.5
3914	do	W. J. Morgan, Oriental, N. C.	80.5
3874	do	Morrow Bros. & Heath Co., Albemarle, N. C.	64.5
3885	do	Selma Supply Co., Selma, N. C.	66.0
4141	do	W. P. Shaw, Jr. & Bros., Winton, N. C.	65.5

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 807 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913, TO JULY 15, 1914.—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
4033	BEETS	D. M. Ferry & Co., Detroit, Mich.	T. L. & W. J. Turnage Co., Farmville, N. C.	70.5
4103	do.	Lake Shore Seed Co., Dunkirk, N. Y.	W. C. Asbury, Linecolton, N. C.	86.0
3342	do.	do.	J. F. Clarke, New Bern, N. C.	57.5
4032	do.	do.	E. E. Rouse & Co., La Grange, N. C.	87.0
4042	do.	do.	W. D. Thomas & Co., Warsaw, N. C.	62.5
3497	do.	do.	W. S. White, Edenton, N. C.	50.5
4202	do.	D. Landreth Seed Co., Bristol, Pa.	Beaufort Drug Co., Beaufort, N. C.	83.5
3745	do.	do.	Hamilton Drug Co., Oxford, N. C.	81.0
3704	do.	L. L. May & Co., St. Paul, Minn.	Beasley-Austin Drug Co., Louisville, N. C.	81.5
4134	do.	do.	Nash Supply Co., Nashville, N. C.	85.0
3258	do.	J. B. Rice Seed Co., Cambridge, N. Y.	A. S. Huske, Fayetteville, N. C.	54.5
4005	do.	do.	J. M. Lewis, Mt. Olive, N. C.	91.5
4155	do.	do.	W. W. Parker, Henderson, N. C.	73.0
4002	do.	do.	C. Scott & Co., Greensboro, N. C.	80.0
3347	do.	do.	Worthy & Ederidge, Washington, N. C.	91.0
3976	do.	do.	do.	76.5
3514	do.	T. W. Wood & Sons, Richmond, Va.	Alexander & Blount, Plymouth, N. C.	81.5
4003	do.	do.	W. S. Allen, Reidsville, N. C.	76.0
3906	do.	do.	W. H. Bowen & Son, Belhaven, N. C.	88.5

3902	do.....	do.....	M. C. Ruffy, Salisbury, N. C.....	88.0
4174	CABBAGE.....	Robert Buist Co., Philadelphia, Pa.....	R. E. L. Cook, Tarboro, N. C.....	74.0
3561	do.....	do.....	Parson Drug Co., Wadesboro, N. C.....	56.5
3477	do.....	do.....	Reese & Alexander Inc., Charlotte, N. C.....	62.5
3278	do.....	do.....	P. A. Thompson, Winston-Salem, N. C.....	54.5
3652	do.....	do.....	I. W. West Drug Co., Mt. Airy, N. C.....	28.5
4192	do.....	Crosman Bros. Co., Rochester, N. Y.....	T. B. Carson, Hendersonville, N. C.....	96.0
3288	do.....	do.....	J. Enura Cox, Winston-Salem, N. C.....	25.0
3282	do.....	do.....	Eford Bros., Winston-Salem, N. C.....	33.0
3556	do.....	do.....	Fox & Lyon, Wadesboro, N. C.....	22.0
3642	do.....	do.....	Golden Rule Drug Co., Walnut Cove, N. C.....	2.5
3843	do.....	do.....	Hart Drug Co., Norwood, N. C.....	27.5
3754	do.....	do.....	Lawnings Drug Store, Lincolnton, N. C.....	17.0
3637	do.....	do.....	Madison Grocery Co., Madison, N. C.....	40.0
3293	do.....	do.....	J. G. Messick, Winston-Salem, N. C.....	16.5
3692	do.....	do.....	W. W. Parker, Henderson, N. C.....	87.0
3647	do.....	do.....	The Peoples Drug Store, Mt. Airy, N. C.....	7.0
4097	do.....	D. M. Ferry & Co., Detroit, Mich.....	Armour Bros. & Thompson, Davidson, N. C.....	97.0
3878	do.....	do.....	N. A. Bell & Co., Dunn, N. C.....	83.0
3981	do.....	do.....	Bruton & Co., Mt. Gilead, N. C.....	86.0
3322	do.....	do.....	Cabarrus Drug Co., Concord, N. C.....	83.0
3467	do.....	do.....	Charlotte Drug Co., Charlotte, N. C.....	96.0
3318	do.....	do.....	Cook & Harris, Concord, N. C.....	40.0
3325	do.....	do.....	Dove-Bost Co., Concord, N. C.....	98.0
3530	do.....	do.....	English Drug Co., Monroe, N. C.....	61.0
3273	do.....	do.....	Farmers Trade House Co., Winston-Salem, N. C.....	70.5

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 807 SAMPLES IN ALL, COLLECTED BY INSPECTORS  
FROM JULY 15, 1913, TO JULY 15, 1914.—CONTINUED

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
3571	CABBAGE	D. M. Ferry & Co., Detroit, Mich.	L. G. Fox, Rockingham, N. C.	93.0
3540	do.	do.	Latham & Richardson, Monroe, N. C.	52.0
3306	do.	do.	J. W. McPherson & Co., Salisbury, N. C.	66.5
3573	do.	do.	Morrow Bros. & Heath Co., Albemarle, N. C.	68.5
3657	do.	do.	Mt. Airy Feed Store, Mt. Airy, N. C.	71.5
3301	do.	do.	Owens Drug Co., Winston-Salem, N. C.	80.5
3566	do.	do.	Parson Drug Co., Wadesboro, N. C.	71.0
3384	do.	do.	Selma Supply Co., Selma, N. C.	65.5
3462	do.	do.	Torrence Drug Co., Gastonia, N. C.	93.5
3535	do.	do.	Dr. S. J. Welsh & Son, Monroe, N. C.	63.0
3472	do.	do.	Woodall & Sheppard, Charlotte, N. C.	66.0
4101	do.	Lake Shore Seed Co., Dunkirk, N. Y.	W. C. Ashbury, Lincolnton, N. C.	91.5
3576	do.	do.	Eagle Pharmacy, Rockingham, N. C.	30.5
3546	do.	do.	Latham Richardson, Monroe, N. C.	89.0
3749	do.	do.	Lawnings Drug Store, Lincolnton, N. C.	6.5
3551	do.	do.	Earle Morrow Drug Store, Hamlet, N. C.	66.5
3525	do.	D. Landreth Seed Co., Bristol, Pa.	English Drug Co., Monroe, N. C.	88.0
3330	do.	do.	Fetzer & Tucker, Reidsville, N. C.	65.5

3585	do	do	J. T. Fields, Laurinburg, N. C.	89.0
3687	do	do	Grant's Pharmacy, Asheville, N. C.	86.5
3298	do	do	E. W. O'Hanlon, Winston-Salem, N. C.	
3364	do	Leonard Seed Co., Chicago, Ill.	W. J. Kirkham & Co., Wilmington, N. C.	86.0
3492	do	T. W. Wood & Sons, Richmond, Va.	W. S. Allen, Reidsville, N. C.	69.0
3315	do	do	Davis Drug Co., Concord, N. C.	67.5
3457	do	do	Gaston Seed & Provision Co., Gastonia, N. C.	99.0
3312	do	do	Gibson Drug Co., Concord, N. C.	89.5
3993	do	do	Mitchell & Barrow, Star, N. C.	69.0
4013	CELERY	Crosman Bros. Co., Rochester, N. Y.	J. J. Adams Sons & Co., Winston-Salem, N. C.	58.3
3974	SWEET CORN	W. W. Barnard & Co., Chicago, Ill.	W. J. Kirkham & Co., Wilmington, N. C.	87.0
3287	do	Crosman Bros. Co., Rochester, N. Y.	J. Enra Cox, Winston-Salem, N. C.	97.0
3281	do	do	Eford Bros., Winston-Salem, N. C.	94.0
4196	do	do	Miller Bros., Waynesville, N. C.	90.0
4197	do	do	do	55.0
3272	do	D. M. Ferry & Co., Detroit, Mich.	Farmers Trade House Co., Winston-Salem, N. C.	76.0
3311	do	do	J. W. McPherson & Co., Salisbury, N. C.	77.0
4175	do	D. Landreth Seed Co., Bristol, Pa.	Grant's Pharmacy, Asheville, N. C.	78.5
4128	do	do	J. H. Rudisill & Co., Lincolnton, N. C.	84.0
4091	do	J. B. Rice Seed Co., Cambridge, N. Y.	Z. M. L. Jeffreys, Goldsboro, N. C.	98.0
4092	do	do	do	93.0
4198	do	do	Leslie Drug Store, Morganton, N. C.	89.5
3972	do	do	W. S. White & Co., Elizabeth City, N. C.	84.0
3973	do	do	do	94.0
3971	do	Wood-Stubbs Co., Louisville, Ky.	Brown Mercantile Co., Chadbourne, N. C.	83.0
4087	do	do	M. W. Pope, Mt. Olive, N. C.	96.0

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 807 SAMPLES IN ALL, COLLECTED BY INSPECTOR FROM JULY 15, 1913, TO JULY 15, 1914.—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
4176	SWEET CORN	T. W. Wood & Sons, Richmond, Va.	Bradsher's Pharmacy, Hendersonville, N. C.	82.5
4195	do	do	Chautauqua Drug Co., Waynesville, N. C.	94.0
4126	do	do	Gaston Seed & Provision Co., Gastonia, N. C.	98.5
4127	do	do	do	88.0
4089	do	do	J. C. Horne, Magnolia, N. C.	94.0
4088	do	do	J. B. Johnston, Greenville, N. C.	88.0
4090	do	do	B. F. Powell, Clinton, N. C.	86.0
4172	do	do	Wilson Drug Co., Wilson, N. C.	88.0
4173	do	do	do	92.0
3563	CUCUMBERS	Robert Buist Co., Philadelphia, Pa.	Parson Drug Co., Wadesboro, N. C.	69.0
4011	do	Crosman Bros. Co., Rochester, N. Y.	J. J. Adams Sons & Co., Winston-Salem, N. C.	68.0
4100	do	D. M. Ferry & Co., Detroit, Mich.	Armour Bros. & Thompson, Davidson, N. C.	70.0
3964	do	do	Bruton & Co., Mt. Gilead, N. C.	83.0
3875	do	do	Morrow Bros. & Heath Co., Albemarle, N. C.	72.0
3886	do	do	Salma Supply Co., Selma, N. C.	88.5
3891	do	D. Landreth Seed Co., Bristol, Pa.	J. T. Fields, Laurinburg, N. C.	79.5
3995	do	T. W. Wood & Sons, Richmond, Va.	Mitchell & Barrow, Star, N. C.	88.0
3683	LETTUCE	J. Bolgiano & Son, Baltimore, Md.	E. Clarke, Weldon, N. C.	3.0
3488	do	Robert Buist Co., Philadelphia, Pa.	R. E. L. Cook, Tarboro, N. C.	95.0

4057	do.....	E. B. Marston Drug Co., Kinston, N. C.....	89.5
3601	do.....	Temple Drug Co., Kinston, N. C.....	97.0
4131	do.....	Hunter Drug Co., Warrenton, N. C.....	96.5
4009	do.....	J. J. Adams Sons & Co., Winston-Salem, N. C.....	48.0
3714	do.....	E. T. Alford, Youngsville, N. C.....	68.5
3781	do.....	J. L. Bailey, Elm City, N. C.....	99.5
3776	do.....	Barnes Bros., Proctorville, N. C.....	98.5
4150	do.....	E. S. Barrett & Co., Jackson, N. C.....	5.5
4028	do.....	F. Barwick, LaGrange, N. C.....	56.5
3849	do.....	E. L. Burns, Maxton, N. C.....	65.5
3720	do.....	Wells Dillery, Roanoke Rapids, N. C.....	34.5
3836	do.....	Kennedy's Drug Store, Gastonia, N. C.....	98.0
3812	do.....	Kiser & Mauncy, Kings Mountain, N. C.....	92.0
3694	do.....	W. W. Parker, Henderson, N. C.....	35.5
4016	do.....	F. D. Scott & Son, Magnolia, N. C.....	3.5
3841	do.....	Shankle, Snuggs Co., Albemarle, N. C.....	11.0
4153	do.....	Herbert Smith, Littleton, N. C.....	96.5
3676	do.....	G. T. Whitehead & Co., Scotland Neck, N. C.....	32.5
4024	do.....	J. D. Williams, Wilson, N. C.....	25.5
4020	do.....	W. A. Wilson, Dover, N. C.....	53.0
3925	do.....	H. L. Arnold, Vanceboro, N. C.....	76.0
3808	do.....	Barnes-Finger Drug Co., Kings Mountain, N. C.....	74.5
3880	do.....	W. A. Bell & Co., Dunn, N. C.....	99.0
3983	do.....	Bruton & Co., Mt. Gilead, N. C.....	98.0
3729	do.....	Burroughs Grocery Co., Warrenton, N. C.....	52.5
3760	do.....	Ruthers Lumber Co., Boardman, N. C.....	99.0

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 807 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913, TO JULY 15, 1914.—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
3911	LETTUCE	D. M. Ferry & Co., Detroit, Mich.	H. A. Chadwick, Pollocksville, N. C.	98.0
3229	do	do	A. J. Cook & Co., Fayetteville, N. C.	96.5
3918	do	do	Walter Credle & Co., Washington, N. C.	70.5
3441	do	do	B. B. Davenport, New Bern, N. C.	86.0
3735	do	do	S. J. Dilday, Ahoskie, N. C.	55.0
3591	do	do	Fitzgerald Drug Co., Rocky Mount, N. C.	98.0
3698	do	do	Franklin Grocery Co., Franklinton, N. C.	97.5
3664	do	do	Harrison & Hill Drug Co., Enfield, N. C.	77.5
4138	do	do	Hill Bros., Cofield, N. C.	93.5
3392	do	do	F. V. Johnston, Greenville, N. C.	96.0
4146	do	do	J. J. Madre & Bro., Windsor, N. C.	86.0
3915	do	do	W. J. Morgan, Oriental, N. C.	99.0
3419	do	do	J. B. Morton, Morehead City, N. C.	77.5
3435	do	do	Potter Bros., Beaufort, N. C.	53.0
3402	do	do	J. H. Roberson & Co., Robersonville, N. C.	93.0
3408	do	do	Theo. Roberson & Co., Williamston, N. C.	92.0
3253	do	do	Robinson Bros., Dunn, N. C.	90.5
3396	do	do	Robinson-Ruffin Co., Tarboro, N. C.	31.5
3241	do	do	W. M. Sanders, Smithfield, N. C.	94.0

3247	do	do	Selma Drug Co., Selma, N. C.	93.0
4142	do	do	W. P. Shaw, Jr. & Bro., Winton, N. C.	100.0
3741	do	do	J. T. Sizemore, Oxford, N. C.	98.5
3255	do	do	W. F. Smith, Benson, N. C.	95.0
3414	do	do	Henry L. Spruill, Plymouth, N. C.	97.5
3861	do	do	Standard Store Co., Aberdeen, N. C.	90.5
3453	do	do	D. W. Tart, Roseboro, N. C.	97.5
4054	do	do	T. L. & W. J. Turnage Co., Farmville, N. C.	98.0
3447	do	do	G. T. Walton & Son, Jacksonville, N. C.	98.5
3386	do	do	Watson & Winslow, Hertford, N. C.	44.5
3426	do	do	E. K. Willis, Washington, N. C.	79.5
3670	do	do	J. D. Winstead & Son, Nashville, N. C.	64.0
3831	do	Lake Shore Seed Co., Dunkirk, N. Y.	Adams Drug Co., Gastonia, N. C.	55.0
3343	do	do	J. F. Clarke, New Bern, N. C.	58.0
3505	do	do	Divers & Roper, Hertford, N. C.	95.5
3264	do	do	J. B. Fields, Fayetteville, N. C.	17.5
3826	do	do	Hamlet Pharmacy, Hamlet, N. C.	40.5
3855	do	do	A. L. Jones, Maxton, N. C.	87.0
3632	do	do	Martin & Price Co., Mt. Olive, N. C.	43.5
3627	do	do	E. S. Mewborn, La Grange, N. C.	85.0
4037	do	do	Murray & Armstrong, Wallace, N. C.	90.5
4031	do	do	E. E. Rouse & Co., La Grange, N. C.	96.5
4048	do	do	Singletary Drug Co., Burgaw, N. C.	72.0
3372	do	do	Tom L. Smith, Plymouth, N. C.	51.5
3621	do	do	H. S. Southerland, Clinton, N. C.	77.5
3503	do	do	J. L. Stashey, Greenville, N. C.	51.0

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 807 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913, TO JULY 15, 1914.—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
3796	LETTUCE	Lake Shore Seed Co., Dunkirk, N. Y.	V. F. Tarlton, Wadesboro, N. C.	25.0
3337	do	do	D. W. Tart, Roseboro, N. C.	99.0
4043	do	do	W. D. Thomas & Co., Warsaw, N. C.	98.0
3498	do	do	W. S. White, Edenton, N. C.	18.0
3708	do	D. Landreth Seed Co., Bristol, Pa.	Aycock Drug Co., Louisville, N. C.	94.0
4200	do	do	Beaufort Drug Co., Beaufort, N. C.	98.0
3611	do	do	Henry Dunn, Kinston, N. C.	97.0
3821	do	do	J. T. Fields, Laurinburg, N. C.	77.0
3746	do	do	Hamilton Drug Co., Oxford, N. C.	92.5
3517	do	do	Roberson, Cory & Co., Robersonville, N. C.	70.0
3320	do	do	W. S. White & Co., Elizabeth City, N. C.	93.5
3705	do	L. L. May & Co., St. Paul, Minn.	Beasley-Austin Drug Co., Louisville, N. C.	85.0
3377	do	do	Divers & Roper, Hertford, N. C.	93.5
3597	do	do	Kyser's Drug Store, Rocky Mount, N. C.	89.0
3259	do	Jerome B. Rice Seed Co., Cambridge, N. Y.	A. S. Huske, Fayetteville, N. C.	95.0
3512	do	T. W. Wood & Sons, Richmond, Va.	N. S. Blanchard & Son, Hertford, N. C.	97.5
3491	do	do	J. A. Mitchener, Edenton, N. C.	78.5
3362	MUSKMELON	Robert Buist Co., Philadelphia, Pa.	R. R. Bellamy, Wilmington, N. C.	81.0
3480	do	do	Reese & Alexander, Inc., Charlotte, N. C.	

3655	do	do	I. W. West Drug Co., Mt. Airy, N. C.	77.0
3656	do	do	do	74.0
3291	do	Crosnan Bros. Co., Rochester, N. Y.	J. Enra Cox, Winston-Salem, N. C.	39.0
3285	do	do	Eford Bros., Winston-Salem, N. C.	84.0
3559	do	do	Fox & Lyon, Wadesboro, N. C.	15.0
3645	do	do	Golden Rule Drug Co., Walnut Cove, N. C.	92.0
3756	do	do	Lawnings Drug Store, Lincolnton, N. C.	37.0
3640	do	do	Madison Grocery Co., Madison, N. C.	96.0
3296	do	do	J. G. Messick, Winston-Salem, N. C.	31.5
3650	do	do	The Peoples Drug Store, Mt. Airy, N. C.	91.0
3470	do	D. M. Ferry & Co., Detroit, Mich.	Charlotte Drug Co., Charlotte, N. C.	64.5
3320	do	do	Cook & Harris, Concord, N. C.	70.0
3328	do	do	Dove-Bost Co., Concord, N. C.	79.0
3333	do	do	English Drug Co., Monroe, N. C.	70.0
3276	do	do	Farmers Trade House Co., Winston-Salem, N. C.	84.5
3574	do	do	L. G. Fox, Rockingham, N. C.	66.0
3543	do	do	Latham & Richardson, Monroe, N. C.	71.0
3309	do	do	J. W. McPherson & Co., Salisbury, N. C.	76.0
3660	do	do	Mt. Airy Feed Store, Mt. Airy, N. C.	71.0
3304	do	do	Owens Drug Store Co., Winston-Salem, N. C.	77.0
3569	do	do	Parson Drug Co., Wadesboro, N. C.	39.0
3465	do	do	Torrence Drug Co., Gastonia, N. C.	77.0
3538	do	do	Dr. S. J. Welsh & Son, Monroe, N. C.	86.0
3475	do	do	Woodall & Sheppard, Charlotte, N. C.	69.5
3579	do	Lake Shore Seed Co., Dunkirk, N. Y.	Eagle Pharmacy, Rockingham, N. C.	32.0
3549	do	do	Latham & Richardson, Monroe, N. C.	93.0

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 807 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913, TO JULY 15, 1914.—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
3752	MUSKMELON	Lake Shore Seed Co., Dunkirk, N. Y.	Lawnings Drug Store, Lincolnton, N. C.	75.0
3554	do	do	Earle Morrow Drug Store, Hamlet, N. C.	81.0
3528	do	D. Landreth Seed Co., Bristol, Pa.	English Drug Co., Monroe, N. C.	84.0
3333	do	do	Fetzer & Tucker, Reidsville, N. C.	96.0
4122	do	do	J. H. Radisill & Co., Lincolnton, N. C.	94.0
4121	do	L. L. May & Co., St. Paul, Minn.	W. C. Asbury, Lincolnton, N. C.	70.5
3363	do	Jerome B. Rice Seed Co., Cambridge, N. Y.	J. F. Clarke, New Bern, N. C.	84.5
3905	do	do	A. S. Huske, Fayetteville, N. C.	94.5
4181	do	do	Leslie Drug Store, Morganton, N. C.	84.5
3988	do	do	C. Scott & Co., Greensboro, N. C.	93.5
3460	do	T. W. Wood & Sons, Richmond, Va.	Gaston Seed & Provision Co., Gastonia, N. C.	91.5
4124	do	do	do	62.0
4123	do	do	H. E. Kendall, Shelby, N. C.	61.5
3803	do	do	Jno. J. Thrower Co., Red Springs, N. C.	66.5
3889	OKRA	D. Landreth Seed Co., Bristol, Pa.	J. T. Fields, Laurinburg, N. C.	97.0
4012	ONIONS	Crosman Bros. Co., Rochester, N. Y.	J. J. Adams Sons & Co., Winston-Salem, N. C.	61.0
3920	do	D. M. Ferry & Co., Detroit, Mich.	Walter Credle & Co., Washington, N. C.	89.5
4105	do	Lake Shore Seed Co., Dunkirk, N. Y.	W. C. Asbury, Lincolnton, N. C.	1.0
3954	PEAS	W. W. Barnard & Co., Chicago, Ill.	W. J. Kirkham & Co., Wilmington, N. C.	78.0

3955	do	do	do	95.0
3957	do	do	T. N. Waters & Bro., Goldsboro, N. C.	84.0
4213	do	J. Bolgiano & Son, Baltimore, Md.	Mitchener Pharmacy, Edenton, N. C.	99.0
3486	do	Robert Buist Co., Philadelphia, Pa.	R. E. L. Cook, Tarboro, N. C.	51.5
4168	do	do	do	95.0
4169	do	do	do	95.0
4080	do	do	J. M. Lewis, Mt. Olive, N. C.	99.0
4079	do	do	B. F. Powell, Clinton, N. C.	96.0
3483	do	do	Saunders & Fowler, Williamston, N. C.	92.0
3711	do	do	Winston-Blanks Drug Co., Youngsville, N. C.	94.5
3726	do	W. Atlee Purpee & Co., Philadelphia, Pa.	Hunter Drug Co., Warrenton, N. C.	78.5
3957	do	Everett B. Clarke Seed Co., Milford, Conn.	Robert R. Bellamy, Wilmington, N. C.	92.0
3958	do	do	do	74.0
3959	do	do	do	99.5
4211	do	do	W. R. Brothers, Edenton, N. C.	94.0
3960	do	do	S. W. Willis, New Bern, N. C.	99.0
3716	do	Crosman Bros. Co., Rochester, N. Y.	E. T. Alford, Youngsville, N. C.	18.5
3777	do	do	Barnes Bros., Proctorville, N. C.	2.5
3851	do	do	E. L. Burns, Maxton, N. C.	81.5
3722	do	do	Wells Dilery, Roanoke Rapids, N. C.	59.0
3772	do	do	Taylor & Cowan, Jackson, N. C.	91.0
3710	do	Diggs & Beadles, Richmond, Va.	Ayeock Drug Co., Louisburg, N. C.	69.0
3208	do	do	A. S. Huske, Fayetteville, N. C.	78.5
3898	do	do	do	99.5
3927	do	D. M. Ferry & Co., Detroit, Mich.	H. L. Arnold, Vanceboro, N. C.	90.0
3731	do	do	Burrongs Grocery Co., Warrenton, N. C.	56.5

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 807 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913, TO JULY 15, 1914.—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
3762	Peas	D. M. Ferry & Co., Detroit, Mich.	Buthers Lumber Co., Boardman, N. C.	85.0
3232	do.	do.	A. J. Cook & Co., Fayetteville, N. C.	97.0
3921	do.	do.	Walter Credle & Co., Washington, N. C.	71.5
3443	do.	do.	B. B. Davenport, New Bern, N. C.	87.5
3737	do.	do.	S. J. Dilday, Aloskie, N. C.	91.0
3593	do.	do.	Fitzgerald Drug Co., Rocky Mount, N. C.	85.0
3700	do.	do.	Franklin Grocery Co., Franklinton, N. C.	54.0
3666	do.	do.	Harrison & Hill Drug Co., Enfield, N. C.	70.5
3387	do.	do.	F. V. Johnston, Greenville, N. C.	86.5
3956	do.	do.	W. J. Kirkham & Co., Wilmington, N. C.	94.0
3417	do.	do.	J. B. Morton, Morehead City, N. C.	83.5
3437	do.	do.	Potter Bros., Beaufort, N. C.	54.5
3399	do.	do.	J. H. Roberson & Co., Robersonville, N. C.	36.5
3405	do.	do.	Theo. Roberson & Co., Williamston, N. C.	93.0
3256	do.	do.	Robinson Bros., Dunn, N. C.	74.5
3393	do.	do.	Robinson-Ruffin Co., Tarboro, N. C.	41.0
3244	do.	do.	W. M. Sanders, Smithfield, N. C.	42.5
3250	do.	do.	Selma Drug Co., Selma, N. C.	94.0
3743	do.	do.	J. T. Sizemore, Oxford, N. C.	87.0

3228	do.....	W. F. Smith, Benson, N. C.....	79.5
3411	do.....	Henry L. Spruill, Plymouth, N. C.....	64.5
3455	do.....	D. W. Tart, Roseboro, N. C.....	51.5
3449	do.....	G. T. Walton & Son, Jacksonville, N. C.....	63.0
3331	do.....	Watson & Winslow, Hertford, N. C.....	89.0
3422	do.....	E. K. Willis, Washington, N. C.....	96.5
3672	do.....	J. D. Winstead & Son, Nashville, N. C.....	92.5
3267	do.....	J. B. Fields, Fayetteville, N. C.....	47.5
3857	do.....	A. L. Jones, Maxton, N. C.....	85.0
4039	do.....	Murray & Armstrong, Wallace, N. C.....	81.0
4034	do.....	E. E. Rouse & Co., La Grange, N. C.....	79.0
4051	do.....	Singestory Drug Co., Burgaw, N. C.....	90.0
3368	do.....	Tom L. Smith, Plymouth, N. C.....	88.5
3623	do.....	H. S. Southerland, Clinton, N. C.....	52.5
3798	do.....	V. F. Tarlton, Wadesboro, N. C.....	72.5
3340	do.....	D. W. Tart, Roseboro, N. C.....	36.0
4045	do.....	W. D. Thomas & Co., Warsaw, N. C.....	96.0
3428	do.....	Beaufort Drug Co., Beaufort, N. C.....	43.0
3969	do.....	Spence & Hollowell, Elizabeth City, N. C.....	98.0
4170	do.....	Thomas Bros., Henderson, N. C.....	98.0
3789	do.....	Charlotte Drug Co., Charlotte, N. C.....	29.0
3609	do.....	J. E. Hood & Co., Kinston, N. C.....	82.0
4086	do.....	do.....	97.0
3269	do.....	A. S. Huske, Fayetteville, N. C.....	92.0
3380	do.....	W. S. White & Co., Elizabeth City, N. C.....	12.0
3374	do.....	Divers & Roper, Hertford, N. C.....	74.5

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 807 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913, TO JULY 15, 1914.—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
3961	PEAS	J. B. Rice Seed Co., Cambridge, N. Y.	Blount Pharmacy, Washington, N. C.	97.5
3965	do	do	J. F. Clarke, New Bern, N. C.	100.0
3966	do	do	do	95.0
3967	do	do	F. S. Duffy, New Bern, N. C.	98.0
3963	do	do	J. H. Hardin, Wilmington, N. C.	98.0
3964	do	do	do	90.0
3261	do	do	A. S. Huske, Fayetteville, N. C.	98.0
3899	do	do	do	62.0
3534	do	do	Z. M. L. Jeffreys, Goldsboro, N. C.	82.5
4084	do	do	do	97.0
4082	do	do	do	90.0
3968	do	do	Spence & Hollowell, Elizabeth City, N. C.	64.0
3367	do	do	C. L. Spencer, New Bern, N. C.	69.0
4084	do	do	T. N. Waters & Bro., Goldsboro, N. C.	93.0
4085	do	do	do	94.0
3962	do	do	W. S. White & Co., Elizabeth City, N. C.	95.5
4083	do	do	do	98.0
3970	do	Wood, Stubbs & Co., Louisville, Ky.	Brown Mercantile Co., Chadbourne, N. C.	92.0
4212	do	do	H. C. Joyner, Rocky Mount, N. C.	99.0

4078	do	do	M. W. Pope, Mt. Olive, N. C.	96.0
3991	do	T. W. Wood & Sons, Richmond, Va.	W. S. Allen, Reidsville, N. C.	84.0
3908	do	do	W. H. Bowen & Son, Belhaven, N. C.	56.0
4177	do	do	Bradsher's Pharmacy, Hendersonville, N. C.	94.0
3900	do	do	English Drug Co., Monroe, N. C.	87.0
3686	do	do	Ferguson Drug Co., Halifax, N. C.	50.0
4125	do	do	Gaston Seed & Provision Co., Gastonia, N. C.	61.0
3990	do	do	Mann Drug Co., High Point, N. C.	97.0
3493	do	do	J. A. Mitchener, Edenton, N. C.	42.5
3901	do	do	M. C. Ruffy, Salisbury, N. C.	87.5
3617	do	do	J. D. Williams, Wilson, N. C.	95.0
4171	do	do	Wilson Drug Co., Wilson, N. C.	97.0
4058	RADISH	Robert Buist Co., Philadelphia, Pa.	E. B. Marston Drug Co., Kinston, N. C.	66.0
4132	do	W. Atlee Burpee & Co., Philadelphia, Pa.	Hunter Drug Co., Warrenton, N. C.	85.0
3979	do	Everett B. Clarke Seed Co., Milford, Conn.	R. R. Bellamy, Wilmington, N. C.	73.5
4029	do	Crosman Bros. Co., Rochester, N. Y.	F. Barwick, La Grange, N. C.	64.5
4017	do	do	F. D. Scott & Son, Magnolia, N. C.	43.0
4154	do	do	Herbert Smith, Littleton, N. C.	28.0
4025	do	do	J. D. Williams, Wilson, N. C.	72.0
4021	do	do	W. A. Wilson, Dover, N. C.	62.5
4099	do	D. M. Ferry & Co., Detroit, Mich.	Amour Bros. & Thompson, Davidson, N. C.	92.0
3926	do	do	H. L. Arnold, Vanceboro, N. C.	94.0
3881	do	do	N. A. Bell & Co., Dunn, N. C.	99.5
3986	do	do	Bruton & Co., Mt. Gilead, N. C.	83.5
3912	do	do	H. A. Chadwick, Pollocksville, N. C.	95.0
3919	do	do	Walter Credle & Co., Washington, N. C.	92.5

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 807 SAMPLES IN ALL, COLLECTED BY INSPECTORS  
FROM JULY 15, 1913, TO JULY 15, 1914.—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
4139	RADISH	D. M. Ferry & Co., Detroit, Mich.	Hill Bros., Cofield, N. C.	93.0
4147	do	do	J. J. Madre & Bro., Windsor, N. C.	98.0
3916	do	do	W. J. Morgan, Oriental, N. C.	97.0
4143	do	do	W. P. Shaw, Jr. & Bro., Winton, N. C.	89.0
4055	do	do	T. L. & W. J. Turnage Co., Farmville, N. C.	93.5
4038	do	Lake Shore Seed Co., Dunkirk, N. Y.	Murray & Armstrong, Wallace, N. C.	92.0
4033	do	do	E. E. Rouse & Co., La Grange, N. C.	90.0
4099	do	do	Singestory Drug Co., Burgaw, N. C.	53.0
4044	do	do	W. D. Thomas & Co., Warsaw, N. C.	76.5
4201	do	D. Landreth Seed Co., Bristol, Pa.	Beaufort Drug Co., Beaufort, N. C.	72.5
3890	do	do	J. T. Fields, Laurinburg, N. C.	97.5
4135	do	L. L. May & Co., St. Paul, Minn.	Nash Supply Co., Nashville, N. C.	56.0
4191	SQUASH	Robert Buist Co., Philadelphia, Pa.	Davis Pharmacy, Marion, N. C.	75.0
3479	do	do	Reese & Alexander, Inc., Charlotte, N. C.	82.0
3280	do	do	P. A. Thompson, Winston-Salem, N. C.	80.0
3654	do	do	I. W. West Drug Co., Mt. Airy, N. C.	92.0
3290	do	Crosman Bros. & Co., Rochester, N. Y.	J. Emra Cox, Winston-Salem, N. C.	37.0
3284	do	do	Eford Bros., Winston-Salem, N. C.	73.0
3558	do	do	Fox & Lyon, Wadesboro, N. C.	84.0

3644	do	Golden Rule Drug Store, Walnut Cove, N. C.	56.0
3755	do	Lawnings Drug Store, Lincolnton, N. C.	50.0
3639	do	Madison Grocery Co., Madison, N. C.	20.0
3295	do	J. G. Messick, Winston-Salem, N. C.	52.0
3649	do	The Peoples Drug Store, Mt. Airy, N. C.	70.0
3469	do	Charlotte Drug Co., Charlotte, N. C.	54.0
3327	do	Dove-Bost Co., Concord, N. C.	60.0
3532	do	English Drug Co., Monroe, N. C.	60.0
3275	do	Farmers Trade House Co., Winston-Salem, N. C.	62.0
3573	do	L. G. Fox, Rockingham, N. C.	54.0
3542	do	Latham & Richardson, Monroe, N. C.	63.0
3308	do	J. W. McPherson & Co., Salisbury, N. C.	25.0
3654	do	Mt. Airy Feed Store, Mt. Airy, N. C.	46.0
3303	do	Owens Drug Co., Winston-Salem, N. C.	62.0
3563	do	Parson Drug Co., Wadesboro, N. C.	48.0
3461	do	Torrence Drug Co., Gastonia, N. C.	66.0
3537	do	Dr. S. J. Welsh & Son, Monroe, N. C.	42.5
3474	do	Woodall & Sheppard, Charlotte, N. C.	55.0
3578	do	Eagle Pharmacy, Rockingham, N. C.	74.0
3548	do	Lathan & Richardson, Monroe, N. C.	26.0
3750	do	Lawnings Drug Store, Lincolnton, N. C.	56.0
3553	do	Earle Morrow Drug Store, Hamlet, N. C.	93.0
3527	do	English Drug Co., Monroe, N. C.	60.0
3893	do	J. T. Fields, Laurinburg, N. C.	64.0
3689	do	Grant's Pharmacy, Asheville, N. C.	76.0
3300	do	F. W. O'Hanlon, Winston-Salem, N. C.	60.0

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 807 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913, TO JULY 15, 1914.—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
3317	SQUASH.....	T. W. Wood & Sons, Richmond, Va.....	Davis Drug Co., Concord, N. C.....	86.0
3459	do.....	do.....	Gaston Seed & Provision Co., Gastonia, N. C.....	92.0
3314	do.....	do.....	Gibson Drug Co., Concord, N. C.....	76.0
3980	TOMATOES.....	Robert Buist Co., Philadelphia, Pa.....	R. R. Bellamy, Wilmington, N. C.....	97.0
3882	do.....	D. M. Ferry & Co., Detroit, Mich.....	N. A. Bell & Co., Dunn, N. C.....	80.0
3985	do.....	do.....	Bruton & Co., Mt. Gilead, N. C.....	80.0
3876	do.....	do.....	Morrow Bros. & Heath Co., Albemarle, N. C.....	81.0
3887	do.....	do.....	Selma Supply Co., Selma, N. C.....	89.0
4104	do.....	Lake Shore Seed Co., Dunkirk, N. Y.....	W. C. Asbury, Lineolnton, N. C.....	90.0
3892	do.....	D. Landreth Seed Co., Bristol, Pa.....	J. T. Fields, Laurinburg, N. C.....	84.5
3989	do.....	T. W. Wood & Sons, Richmond, Va.....	J. F. Fulton, Greensboro, N. C.....	91.0
3994	do.....	do.....	Mitchell & Barrow, Star, N. C.....	92.5
3867	TURNIPS.....	Robert Buist Co., Philadelphia, Pa.....	Doane Herring, Wilson, N. C.....	53.5
3868	do.....	do.....	do.....	32.0
4129	do.....	W. Atlee Burpee & Co., Philadelphia, Pa.....	Hunter Drug Co., Warrenton, N. C.....	32.5
3712	do.....	Crosman Bros. Co., Rochester, N. Y.....	E. T. Alford, Youngsville, N. C.....	85.0
3779	do.....	do.....	J. L. Bailey, Elm City, N. C.....	78.5
3774	do.....	do.....	Barnes Bros., Proctorville, N. C.....	83.5
4148	do.....	do.....	E. S. Barrett & Co., Jackson, N. C.....	86.5

4026	do.	do.	F. Barwick, La Grange, N. C.	71.0
3847	do.	do.	E. L. Burns, Maxton, N. C.	44.0
3718	do.	do.	Wells Dillery, Roanoke Rapids, N. C.	27.9
3844	do.	do.	Hart Drug Co., Norwood, N. C.	19.0
3834	do.	do.	Kennedy's Drug Store, Gastonia, N. C.	25.0
3810	do.	do.	Kiser & Mauney, Kings Mountain, N. C.	12.5
3766	do.	do.	Ruffin-High Co., Wilson, N. C.	86.0
4014	do.	do.	F. D. Scott & Son, Magnolia, N. C.	75.0
3839	do.	do.	Shankle, Snuggs Co., Albemarle, N. C.	3.0
4151	do.	do.	Herbert Smith, Littleton, N. C.	91.0
3769	do.	do.	Taylor & Cowan, Jackson, N. C.	76.0
3874	do.	do.	G. T. Whitehead & Co., Scotland Neck, N. C.	22.0
4022	do.	do.	J. D. Williams, Wilson, N. C.	86.0
4018	do.	do.	W. A. Wilson, Dover, N. C.	82.0
3923	do.	D. M. Ferry & Co., Detroit, Mich.	H. L. Arnold, Vanceboro, N. C.	95.5
3806	do.	do.	Barnes-Finger Drug Co., Kings Mountain, N. C.	99.0
3877	do.	do.	N. A. Bell & Co., Duane, N. C.	96.0
3727	do.	do.	Burroughs Grocery Co., Warrenton, N. C.	90.0
3758	do.	do.	Buthers Lumber Co., Boardman, N. C.	93.0
3909	do.	do.	H. A. Chadwick, Pollocksville, N. C.	96.5
3227	do.	do.	A. J. Cook & Co., Fayetteville, N. C.	82.5
3917	do.	do.	Walter Credle & Co., Washington, N. C.	90.5
3439	do.	do.	B. B. Davenport, New Bern, N. C.	81.5
3733	do.	do.	S. J. Dilday, Ahsokie, N. C.	99.5
3589	do.	do.	Fitzgerald Drug Co., Rocky Mount, N. C.	85.5
3696	do.	do.	Franklin Grocery Co., Franklinton, N. C.	97.0

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 807 SAMPLES IN ALL, COLLECTED BY INSPECTORS  
FROM JULY 15, 1913, TO JULY 15, 1914.—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
3682	TURNIPS	D. M. Ferry & Co., Detroit, Mich.	Harrison & Hill Drug Co., Enfield, N. C.	91.0
4136	do	do	Hill Bros., Cofield, N. C.	85.0
3389	do	do	F. V. Johnston, Greenville, N. C.	96.0
4144	do	do	J. J. Madre & Bro., Windsor, N. C.	89.5
3913	do	do	W. J. Morgan, Oriental, N. C.	83.5
3421	do	do	J. B. Morton, Morehead City, N. C.	88.5
3483	do	do	Potter Bros., Beaufort, N. C.	70.0
3401	do	do	J. H. Roberson & Co., Robersonville, N. C.	87.5
3407	do	do	Theo. Roberson & Co., Williamston, N. C.	97.5
3251	do	do	Robinson Bros., Dunn, N. C.	73.0
3365	do	do	Robinson-Ruffin Co., Tarboro, N. C.	100.0
3239	do	do	W. M. Sanders, Smithfield, N. C.	75.5
3245	do	do	Selma Drug Co., Selma, N. C.	97.5
3883	do	do	Selma Supply Co., Selma, N. C.	96.5
4140	do	do	W. P. Shaw, Jr. & Bro., Winton, N. C.	100.0
3739	do	do	J. T. Sizemore, Oxford, N. C.	95.0
3233	do	do	W. F. Smith, Benson, N. C.	83.0
3413	do	do	Henry L. Spruill, Plymouth, N. C.	93.5
3359	do	do	Standard Store Co., Aberdeen, N. C.	

3451	do.....	D. W. Tart, Roseboro, N. C.....	90.5
4052	do.....	T. L. & W. J. Turnage Co., Farmville, N. C.....	79.0
3445	do.....	G. T. Walton & Son, Jacksonville, N. C.....	73.5
3384	do.....	Watson & Winslow, Hertford, N. C.....	84.5
3425	do.....	E. K. Willis, Washington, N. C.....	71.5
3668	do.....	J. D. Winstead & Son, Nashville, N. C.....	78.0
3829	do.....	Adams Drug Co., Gastonia, N. C.....	43.0
4102	do.....	W. C. Asbury, Lenoir, N. C.....	94.0
3341	do.....	J. F. Clarke, New Bern, N. C.....	39.5
3506	do.....	Divers & Roper, Hertford, N. C.....	95.5
3202	do.....	J. B. Fields, Fayetteville, N. C.....	56.5
3824	do.....	Hamlet Pharmacy, Hamlet, N. C.....	9.0
3853	do.....	A. L. Jones, Maxton, N. C.....	48.0
3545	do.....	Latham & Richardson, Monroe, N. C.....	67.5
3630	do.....	Martin & Price Co., Mt. Olive, N. C.....	91.0
3625	do.....	E. S. Mewborn, La Grange, N. C.....	9.0
4036	do.....	Murray & Armstrong, Wallace, N. C.....	94.5
4030	do.....	E. E. Rouse & Co., La Grange, N. C.....	20.5
4047	do.....	Singestory Drug Co., Burgaw, N. C.....	93.0
3371	do.....	T. L. Smith, Plymouth, N. C.....	3.0
3619	do.....	H. S. Southerland, Clinton, N. C.....	22.0
3501	do.....	J. L. Stashey, Greenville, N. C.....	5.0
3794	do.....	V. F. Tartton, Wadesboro, N. C.....	17.5
3333	do.....	D. W. Tart, Roseboro, N. C.....	8.5
4041	do.....	W. D. Thomas Co., Warsaw, N. C.....	79.0
3496	do.....	W. S. White, Edenton, N. C.....	25.5

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 807 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913, TO JULY 15, 1914.—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
3431	TURNIPS.....	D. Landreth Seed Co., Bristol, Pa.	Beaufort Drug Co., Beaufort, N. C.	91.5
4199	do.....	do.....	do.....	76.0
3319	do.....	do.....	J. T. Fields, Laurinburg, N. C.	98.0
3516	do.....	do.....	Roberson, Cory & Co., Robersonville, N. C.	22.0
3364	do.....	Leonard Seed Co., Chicago, Ill.	W. J. Kirkham & Co., Wilmington, N. C.	36.0
4094	do.....	do.....	J. M. Lewis, Mt. Olive, N. C.	97.5
3395	do.....	L. L. May & Co., St. Paul, Minn.	Kyser's Drug Co., Rocky Mount, N. C.	90.5
4133	do.....	do.....	Nash Supply Co., Nashville, N. C.	98.0
3257	do.....	Jerome B. Rice Seed Co., Cambridge, N. Y.	A. S. Huske, Fayetteville, N. C.	75.5
3987	do.....	do.....	C. Seatt & Co., Greensboro, N. C.	90.5
3869	do.....	T. W. Wood & Sons, Richmond, Va.	Hardy Drug Co., Washington, N. C.	90.0
3872	do.....	do.....	Raeoford Hardware Co., Raeoford, N. C.	83.5
3865	do.....	do.....	J. W. Sharp, Elm City, N. C.	86.5
3870	do.....	do.....	D. W. Tart, Roseboro, N. C.	84.5
3871	do.....	do.....	do.....	30.5
3866	do.....	do.....	John L. Wooten Drug Co., Greenville, N. C.	74.5
3350	WATERMELONS	Robert Buist Co., Philadelphia, Pa.	R. R. Bellamy, Wilmington, N. C.	74.0
3977	do.....	do.....	do.....	70.0
4005	do.....	do.....	S. F. Brown & Co., High Point, N. C.	90.5

4118	do.	do.	Lowing & Costner, Lincolnton, N. C.	84.0
3604	do.	do.	Temple Drug Co., Kinston, N. C.	74.0
3605	do.	do.	do.	86.5
3979	do.	do.	R. R. Bellamy, Wilmington, N. C.	80.0
3292	do.	do.	J. Emra Cox, Winston-Salem, N. C.	54.0
3286	do.	do.	Eford Bros., Winston-Salem, N. C.	67.5
3560	do.	do.	Fox & Lyon, Wadesboro, N. C.	57.5
3646	do.	do.	Golden Rule Drug Co., Walnut Cove, N. C.	57.5
3757	do.	do.	Lawnings Drug Store, Lincolnton, N. C.	60.0
3641	do.	do.	Madison Grocery Co., Madison, N. C.	64.0
3297	do.	do.	J. G. Messick, Winston-Salem, N. C.	50.0
3651	do.	do.	The Peoples Drug Store, Mt. Airy, N. C.	56.0
3581	do.	do.	Deans & Moye Co., Goldsboro, N. C.	43.5
3324	do.	do.	Cabarrus Drug Co., Concord, N. C.	72.0
3471	do.	do.	Charlotte Drug Co., Charlotte, N. C.	60.0
3321	do.	do.	Cook & Harris, Concord, N. C.	70.0
3329	do.	do.	Dove-Bost Co., Concord, N. C.	58.0
3534	do.	do.	English Drug Co., Monroe, N. C.	65.0
3277	do.	do.	Farmers Trade House Co., Winston-Salem, N. C.	80.0
3575	do.	do.	L. G. Fox, Rockingham, N. C.	62.5
3544	do.	do.	Latham & Richardson, Monroe, N. C.	67.5
3310	do.	do.	J. W. McPherson & Co., Salisbury, N. C.	46.0
3601	do.	do.	Mt. Airy Feed Store, Mt. Airy, N. C.	58.0
3305	do.	do.	Owens Drug Co., Winston-Salem, N. C.	82.5
3570	do.	do.	Parson Drug Co., Wadesboro, N. C.	55.0
3466	do.	do.	Torrence Drug Co., Gastonia, N. C.	52.5

TABLE XV.—RESULTS OF GERMINATION TESTS OF 16 KINDS OF VEGETABLE SEEDS, 807 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1913, TO JULY 15, 1914.—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
3588	WATERMELONS	D. M. Ferry & Co., Detroit, Mich.	T. N. Waters & Bros., Goldsboro, N. C.	33.0
3539	do	do	Dr. S. J. Welsh & Son, Monroe, N. C.	70.0
3476	do	do	Woodall & Sheppard, Charlotte, N. C.	82.5
3580	do	Lake Shore Seed Co., Dunkirk, N. Y.	Eagle Pharmacy, Rockingham, N. C.	35.0
3550	do	do	Latham & Richardson, Monroe, N. C.	26.0
3753	do	do	Lawnings Drug Store, Lincolnton, N. C.	42.5
3555	do	do	Earle Morrow Drug Store, Hamlet, N. C.	92.5
3529	do	D. Landreth Seed Co., Bristol, Pa.	English Drug Co., Monroe, N. C.	77.5
3334	do	do	Fetzer & Tucker, Reidsville, N. C.	66.0
4116	do	do	J. H. Rudisill & Co., Lincolnton, N. C.	80.0
4117	do	do	do	71.5
4120	do	L. L. May & Co., St. Paul, Minn.	W. C. Asbury, Lincolnton, N. C.	69.0
4119	do	do	Clarence Clapp, Newton, N. C.	61.0
3904	do	J. B. Rice Seed Co., Cambridge, N. Y.	A. S. Huske, Fayetteville, N. C.	78.0
4093	do	do	Z. M. L. Jeffreys, Goldsboro, N. C.	94.0
4180	do	do	Leslie Drug Store, Morganton, N. C.	76.0
4178	do	T. W. Wood & Sons, Richmond, Va.	Bradsher's Pharmacy, Hendersonville, N. C.	89.5
4006	do	do	J. F. Fulton, Greensboro, N. C.	8.5
3461	do	do	Gaston Seed & Provision Co., Gastonia, N. C.	67.0

4115	do.	do.	66.0
4113	do.	H. E. Kendall, Shelby, N. C.	77.0
4114	do.	do.	78.0
4179	do.	L. A. Kincaid, Morganton, N. C.	89.0
3903	do.	M. C. Ruffy, Salisbury, N. C.	78.5
3804	do.	Jno. J. Steward Co., Red Springs, N. C.	40.0

TABLE NO. 16.

SHOWING NUMBER AND AVERAGE PER CENT OF GERMINATION OF VEGETABLE SEED SAMPLES  
TESTED, ACCORDING TO WHOLESALE DEALERS.

Wholesale Dealer	Number of Samples Tested	Average Per Cent of Germination
W. W. Barnard & Co., Chicago, Ill.....	9	87.00
J. Bolgiano & Son, Baltimore, Md.....	2	51.00
Robert Buist Co., Philadelphia, Pa.....	63	78.12
W. Atlee Burpee & Co., Philadelphia, Pa.....	6	76.50
Everett B. Clarke Seed Co., Milford, Conn.....	11	90.45
Crosman Bros. Co., Rochester, N. Y.....	113	60.56
Diggs & Beadles, Richmond, Va.....	5	60.70
D. M. Ferry & Co., Detroit, Mich.....	233	77.64
Griffith & Turner, Baltimore, Md.....	2	61.00
Lake Shore Seed Co., Dunkirk, N. Y.....	95	64.04
D. Landreth Seed Co., Bristol, Pa.....	54	80.21
Leonard Seed Co., Chicago, Ill.....	27	72.19
L. L. May & Co., St. Paul, Minn.....	18	68.36
J. B. Rice Seed Co., Cambridge, N. Y.....	73	88.30
Wood, Stubbs & Co., Louisville, Ky.....	12	95.75
T. W. Wood & Sons, Richmond, Va.....	84	73.88

SEED THOUGHTS FOR NORTH CAROLINA FARMERS.

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1. Send samples of your seed to the North Carolina Seed Laboratory for examination and test before you buy. It will pay you; there is no charge.

2. The North Carolina Seed Laboratory is all yours. Use it for your own personal gain. Five cents will bring it right to your door, where it will solve your seed problems, free of charge.

3. Know what you are about to buy before you get it—you can't take seeds out of the ground after they have been sown.

4. Send your tobacco seeds to the North Carolina Seed Laboratory and have them re-cleaned—it will pay you, and we bear the expense.

5. Ask your seedsman why he refuses to guarantee the purity or the germination of his seed. If he will not guarantee his goods, send us a sample before you buy and find the reason—you may decide to let them remain HIS goods.

6. Send three or four tablespoonfuls of your grass, clover and other small seeds and about a cupful of corn, wheat, oats, peas and other seeds of this size when submitting a sample to the Laboratory for examination. Write your name and address plainly on the package and address it to the "North Carolina Seed Laboratory, Department of Agriculture, Raleigh, N. C." State whether you want us to examine it for PURITY or GERMINATION.

7. Do not buy or use "feed" oats for seed oats—they may have been heated in the bin and may fail to come up.

8. Seeds containing wild onions, wild mustard, couch grass, Canada thistle, wild oats, clover or alfalfa dodder, corn cockle, dog fennel, cheat, or wild carrot are unlawful for sale, for seeding purposes, in North Carolina.

9. Would you sell your neighbor seed too impure and dirty to sow on your own land? Then do not sell such seed to the seed dealer—your neighbor or some other man's might get them from the seedsman.

10. It is an agricultural sin, if not a moral crime, to sell clover seed containing dodder or seed wheat containing onions or cockle from your farm to a seedsman. Better sell such seed to your neighbor, who will then know whom to sue for damages.

11. All legitimate seed dealers in North Carolina have a license. Beware of the seed fakir who asks fabulous prices for ordinary seeds. Buy from honest seedsmen and leave the seed peddlers alone.

12. Watch the man who is willing to sell you seed without having a license. If he is willing to break the law for YOUR benefit, he might be willing to sell you inferior seeds for HIS benefit.

13. How many of your clover seed will come up from every hundred planted?

14. When your seed fail to come up you lose doubly.

15. The North Carolina Seed Act fixes the standards of germination and purity for the following agricultural seeds. Purity means freedom from weed seeds and other foreign seeds; viability means germinating power or the ability to come up when planted.

<i>Name of Seed</i>	<i>Per Cent of</i>	
	<i>Purity</i>	<i>Viable Seed</i>
Alfalfa .....	96	80
Barley .....	98	90
Blue grass, Canada .....	90	45
Blue Grass, Kentucky.....	80	45
Brome, awnless .....	90	75
Clover, alsike .....	96	75
Buckwheat .....	96	90
Clover, crimson .....	98	85
Clover, red .....	92	80
Clover, white .....	90	75
Corn, field .....	99	94
Corn, sweet .....	99	75
Fescue, meadow .....	95	85
Flax .....	96	89
Millet, Pearl .....	99	65
Millet, common .....	90	85
Millet, hog .....	90	85
Oats .....	98	90
Oat grass, tall .....	72	70
Orchard grass .....	70	70
Rape .....	99	90
Redtop .....	90	70
Rye .....	98	90
Rye grass, perennial .....	96	90
Rye grass, Italian .....	95	80
Sorghum .....	96	80
Sorghum for fodder.....	90	60
Timothy .....	96	85
Wheat .....	98	90

16. Wheat does not "turn to cheat," but seed wheat containing onions and cockle will cheat you out of a first-class crop.

17. Pestiferous weeds, like other troubles, are generally imported. See that you do not "import" weed seeds along with your other seeds from your seed dealer.

18. Dodder, wild carrot, cheat, wild onions, wild mustard, ox-eye daisy, bristly buckhorn, bracted plantain, Canada thistle, Russian thistle, nut grass, knawel, spiny pigweed, crab grass, sheep sorrel, smart weed, Spanish needles, dog fennel, and most other bad weeds are all imported into this country from Europe, or some other country, in impure seeds.

19. How long did it take you to rid your wheat fields and pastures of wild carrots and wild onions? These pests were imported from Europe in impure seeds.

20. Sow only good, clean seed.

21. Are your seed oats and seed wheat clean, or, are they full of dirt, cheat, and onions?

22. Any plant in your field different from the crop you are trying to grow is a weed.

23. Reclean your wheat before sowing—it will pay you.

24. Treat your wheat and oats for smut by immersing the seed for thirty minutes in a solution of a pint of formalin in fifty gallons of water.

25. What is your method of ridding your fields of dodder, or the yellow "love vine?" This pest was also imported from Europe.

26. Those yellow spots of dodder in your clover fields are cancers that eat the vitals out of your clover crop. Quarantine this pest as you would smallpox.



### LEAF TOBACCO SALES FOR JUNE, 1914.

Pounds sold for producers, first hand.....	137,752
Pounds sold for dealers.....	16,128
Pounds resold for warehouse.....	18,018
Total .....	<u>171,898</u>

### LEAF TOBACCO SALES FOR JULY, 1914.

Pounds sold for producers, first hand.....	124,913
Pounds sold for dealers.....	1,192
Pounds resold for warehouse.....	8,558
Total .....	<u>134,663</u>



**THE BULLETIN**  
OF THE  
**NORTH CAROLINA**  
**DEPARTMENT OF AGRICULTURE**  
**RALEIGH**

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**Vol. 35, No. 10.**

**OCTOBER, 1914**

**Whole No. 201**

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**COMMERCIAL FEEDS**

LIBRARY  
NEW YORK  
BOTANICAL  
GARDEN

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\*Assigned by the Bureau of Soils, United States Department of Agriculture.

†Assigned by the Bureau of Animal Husbandry, United States Department of Agriculture.

‡In cooperation with Bureau of Plant Industry, United States Department of Agriculture.

## LETTER OF TRANSMITTAL.

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HON. W. A. GRAHAM,

*Commissioner of Agriculture.*

SIR:—I submit herewith manuscript covering the inspection and analysis of concentrated stock feeds during the past year. I recommend its publication as the October BULLETIN.

Very respectfully,

B. W. KILGORE,

*State Chemist.*

Approved for printing:

W. A. GRAHAM, *Commissioner.*



## COMMERCIAL FEEDS

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J. M. PICKEL, FEED CHEMIST.\*

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The analyses of concentrated commercial Feeding Stuff's published in this BULLETIN comprise all those made during the year ending midsummer, 1914. The total number of samples analyzed is 375, of which 287 samples are official, that is, were drawn by our official inspector; the remainder, 88, are unofficial, that is, were sent in by citizens of the State.

There were in all 954 guarantees; in 270 cases (28 per cent) the feeds were below guarantee; the remainder (72 per cent) up to, or above guarantee. The discrepancy below or above guarantee was usually insignificant. If only cases in which protein and fat were respectively 1 or more per cent and 0.5 or more per cent below guaranteed, and fiber 1 or more per cent above, or taken into account, then of the total 954 guarantees only 11 per cent were not as good as guaranteed.

The following table gives a general summary of the different classes of feeds analyzed, the number of each, the number of guarantees on protein, fat and fiber; the number of cases, and their percentage, that fell below guarantee:

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\*Assisted by J. Q. Jackson, E. S. Dewar, W. H. Stroud. Only a small fraction of the time—as much as is implied by the making of the protein determinations—of these gentlemen was given to the work of this bulletin. In addition to the duties of feed chemist, Dr. Pickel has charge of the toxicological and water work of the Department.

1914	FIBER															
	FAT				Below Guarantee				Guaranteed							
	Below guarantee		One or More Per Cent Below Guarantee		In Any Degree		One or More Per Cent Below Guarantee		Number		Per Cent					
	Guaranteed	In Any Degree	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent				
Samples	Number	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent					
NAMES OF FEEDING STUFFS	Wheat Bran.....	57	49	21	43	7	14	49	11	22	5	10	39	80	3	6
	Wheat Middlings, or Shorts, and Red Dog.....	70	63	11	17	7	11	63	13	20	7	11	63	53	5	10
	Mixtures of Middlings, or Shorts, and Screenings.....	17	11	6	55	6	55	11	5	45	2	18	11	100	0	0
	Mixtures of Middlings, or Shorts, and Screenings*.....	15	15	7	47	1	7	15	6	40	1	7	15	100	0	0
	Shipstuf.....	30	26	6	23	0	0	26	11	42	2	8	26	19	73	3
	Mixtures not containing Molasses.....	59	47	17	36	4	8	47	26	55	16	34	47	34	72	8
	Mixtures containing Molasses.....	69	63	21	33	6	9	63	29	46	20	32	63	50	79	16
	Poultry Feeds.....	26	24	4	17	0	0	24	7	29	4	17	24	23	96	0
	Cottonseed Meal and Cottonseed Feed.....	19	11	4	36	3	27	7	3	43	2	26	7	100	0	0
	Corn, Cracked Corn, Chops, Corn Bran.....	14	4	2	50	0	0	4	3	75	3	75	4	100	0	0
	Gluten Feed, Beet Pulp.....	6	5	1	20	0	0	5	0	0	0	0	4	100	0	0
	Rice Products.....	3	3	1	33	0	0	3	0	0	0	0	3	100	0	0
	Wheat, Oats, Screenings, Sweepings.....	6	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	Poultry and Stock Tonics.....	4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	Totals (1914).....	375	321	102	32	34	10	114	36	62	13	316	262	83	27	8
	Totals (1913).....	319	271	70	26	-----	-----	67	25	-----	-----	-----	271	193	71	-----

\*Bearing trade names.

## REQUIREMENTS OF THE STATE FEED LAW.

The following ruling and regulations adopted by the Board of Agriculture under authority of Section 9 of the State Feed Law gives the chief points of the law with which every manufacturer must comply before offering feeds for sale in this State, also the rulings and definitions which have been adopted for the enforcement of the law.

First. All manufacturers, agents, or dealers who propose to sell or offer for sale any commercial feed in this State must apply to the Commissioner of Agriculture for blank forms on which they will be required to register the name or brand of the feed which they propose to sell, their own names and addresses, and also the places where their goods are manufactured: *Provided*, if a person desiring to so register is not the actual manufacturer, he may be permitted to register and guarantee the product, using the words "manufactured for and guaranteed by." They must also give the guaranteed analysis of their goods, stating the minimum percentage of protein and fat which they contain and the maximum percentage of crude fiber. They must also register the various ingredients of which their feeds are composed.

Second. All feeds must be offered for sale in sacks or packages of uniform capacity, as prescribed in Section 1 of the Act; that is, bags or packages must contain 25, 50, 75, 100, 125, 150, 175, or 200 pounds each. Manufacturers or dealers will be required to furnish the analysis tags which must be attached to these sacks or packages. On these tags must be clearly printed all the essential information given in the registration above, as illustrated below. Said tags must measure not less than  $4\frac{1}{2} \times 2\frac{1}{2}$  inches. Guarantee tags must be printed in plain type with black ink. Rubber stamps will not be recognized on guarantee tags.\*

Third. Three guarantees are required, viz.: the minimum percentage of crude protein and crude fat and the maximum percentage of crude fiber. In other words, the crude protein and crude fat in a manufacturer's goods must not be less than his guarantee, and the fiber must not be above his guarantee. The percentage of carbohydrates may be stated, but this is not required. The names of the ingredients of which the feed is composed must be plainly printed on the tag.

Fourth. Definitions have been adopted for a number of feeds. In such cases where a feed or feed material is covered by a definition the feed must correspond within reasonable limits to the definition which has been adopted for it. With all feeds covered by definitions and all other feeds or mixtures of feeds the manufacturer is required to make his own minimum guarantee of protein and fat and his maximum guarantee of fiber: *Provided*, that no mixed feeds will be accepted for registration or allowed to be offered for sale in this State that contain less than 9 per cent crude protein, except mixtures of whole or partially ground grains.

Fifth. When grain screenings containing weed seeds which have feeding value are used in mixed feeds such screenings and seeds must be ground in such manner as to destroy the viability of the seeds.

Sixth. It is optional with manufacturers or sellers whether the sack be branded, although that is always desired; but the required items

\*See page 23 for requirements when poultry feeds are put up in smaller packages than 25 lbs.

must always be printed on the tag in black-colored ink, but not printed with a rubber stamp. The tax stamp must be affixed to the tag, preferably alongside the printed matter, but in case of necessity may be attached to the back of the tag.

Seventh. Feeds may be shipped in bulk from one manufacturer direct to another manufacturer who expects to subsequently sack and tag the same; but in this case the shipper, in consideration of this permission, must notify this Department at the time of the shipment of the name and consignee and the tonnage shipped; otherwise, the whole shipment will be subject to seizure as being untagged and unstamped.

Eighth. The principal adulterants employed in the feed trade are oat hulls, barley hulls, rice hulls, corncobs, peanut shells, screenings, corn bran, and cotton-seed hulls. Some of the above may be found legitimately in a feed consequent to the grinding of the whole seed, but when used out of proper proportion or in excess of the amount obtained in grinding the whole seed, or when foreign to the product, or if injurious to the health of domestic animals, will be considered an adulteration.

Ninth. If any substance, such as chaff, screenings, damaged, faulty, or unlike seeds or grains or foreign materials be mixed with or added to feeds as an adulterant and not plainly marked on the package containing it or in which it is offered for sale, showing the true composition of the mixture, it will be considered a violation of the law; *e. g.*, if oats be mixed with screenings and shrunken seeds or barley, the proper method of branding would be "Oats and Screenings," "Oats and Barley."

Tenth. When wheat bran and screenings are mixed, the mixture shall be branded "Wheat Bran and Screenings," and the word "Screenings" shall appear in the same size type as the words "Wheat Bran."

Eleventh. The sale of poultry and cattle feed which contain poisonous weed seeds in appreciable quantities, such as corn cockle and jimson weed (Jamestown weed), are forbidden.

Twelfth. When corn bran is mixed with wheat bran, the mixture shall not be branded "Bran," but shall be branded "Mixed Bran," or be sold under a trade name, and be so registered.

Thirteenth. When corn bran is mixed with wheat bran and wheat middlings, the mixture shall not be branded "Bran and Middlings," or "Bran and Middlings Mixed," but shall be branded "Mixed Feed" or "Feed" or be sold under a trade name, and be so registered.

Fourteenth. When corn bran is mixed with wheat middlings, the mixture shall not be branded "Middlings" or "Middlings and Bran," but shall be branded "Mixed Feed" or "Feed," or be sold under some trade name, and be so registered.

Fifteenth. No feed shall be registered or allowed on sale in this State under a name that is misleading as to its quality.

Sixteenth. The Commissioner shall have the power to require registration annually of any or all commercial feeds sold, offered or exposed for sale in this State.

Seventeenth. The Commissioner shall have the power to refuse to allow any manufacturer, importer, jobber, broker, agent, dealer, or any person or persons to lower the registration or guaranteed analysis of his or their product or products during the calendar year, unless satisfactory reasons are presented for making such change or changes.

Eighteenth. All cracked corn sold, offered or exposed for sale in this State made from damaged corn shall be branded "Damaged Cracked Corn" or "Cracked Corn Made from Damaged Corn."

The following definitions for commercial feeds have been adopted by the Association of Feed Control Officials of the United States. Before these definitions were adopted by this Association the manufacturers affected were given hearings and every effort made to make the definitions accurate and fair. Definitions for products not included in this list will be added as soon as adopted by the Association:

### DEFINITIONS

*Adopted by Feed Control Officials of the United States.*

*Meal* is the clean, sound, ground product of the entire grain, cereal or seed which it purports to represent.

*Chop* is a ground or chop feed composed of one or more different cereals or by-products thereof. If it bears a name descriptive of the kind of cereals, it must be made exclusively of the entire grains of those cereals.

*Screenings* are the smaller imperfect grains, weed seeds and other foreign material having feeding value, separated in cleaning the grain.

*Flax Plant By-Product* is that portion of the flax plant remaining after the separation of the seed, the baste fiber and a portion of the shives, and consists of flax shives, flax pods, broken and immature flax seeds and the corticle tissue of the stem.

*Alfalfa Meal* is the entire alfalfa hay ground, and does not contain an admixture of ground alfalfa straw or other foreign materials.

*Linseed Meal* is the ground residue after extraction of part of the oil from ground flaxseed.

*Blood Meal* is ground dried blood.

*Meat Scrap* and *Meat Meal* are the ground residues from animal tissue exclusive of hoof and bone. If they contain any considerable amount of bone, they must be designated *Meat and Bone Scrap*, or *Meat and Bone Meal*. If they bear a name descriptive of their kind, composition or origin, they must correspond thereto.

*Digester Tankage* is the residue from animal tissue exclusive of hoof and horn specially prepared for feeding purposes by tanking under live steam, drying under high heat, and suitable grinding. If it contains any considerable amount of bone, it must be designated *Digester Meat and Bone Tankage*.

*Cracklings* are the residue after partially extracting the fats and oils from the animal tissue. If they bear a name descriptive of their kind, composition or origin, they must correspond thereto.

*Brewers' Dried Grains* are the properly dried residue from cereals obtained in the manufacture of beer.

*Distillers' Dried Grains* are the dried residue from cereals obtained in the manufacture of alcohol and distilled liquors. The product shall bear the designation indicating the cereal predominating.

*Malt Sprouts* are the sprouts of the barley grain. If the sprouts are derived from any other malted cereal, the source must be designated.

*Buckwheat Shorts or Buckwheat Middlings* are that portion of the buckwheat grain immediately inside of the hull after separation from the flour.

*Rice Bran* is the cuticle beneath the hull.

*Rice Hulls* are the outer chaffy coverings of the rice grain.

*Rice Polish* is the finely powdered material obtained in polishing the kernel.

*Oat Groats* are the kernels of the oat berry with the hulls removed.

*Oat Hulls* are the outer chaffy coverings of the oat grain.

*Oat Middlings* are the floury portion of the oat groat obtained in the milling of rolled oats.

*Oat Shorts* are the covering of the oat grain lying immediately inside the hull, being a fuzzy material carrying with it considerable portions of the fine floury part of the groat obtained in the milling of rolled oats.

*Clipped Oat By-Product* (term oat clippings not recognized) is the resultant by-product obtained in the manufacture of clipped oats. It may contain light, chaffy material broken from the ends of the hulls, empty hulls, light, immature oats and dust. It must not contain an excessive amount of oat hulls.

*Corn Bran* is the outer coating of the corn kernel.

*Corn Feed Meal* is the sifting obtained in the manufacture of cracked corn and table meal made from the whole grain.

*Corn Germ Meal* is a product in the manufacture of starch, glucose and other corn products and is the germ layer from which a part of the corn oil has been extracted.

*Grits* are the hard, flinty portions of Indian corn without hulls and germ.

*Hominy Meal, Hominy Feed, or Hominy Chop* is a mixture of the bran coating, the germ and a part of the starchy portion of the corn kernel obtained in the manufacture of hominy grits for human consumption.

\**Corn Gluten Meal* is that part of commercial shelled corn that remains after the separation of the larger part of the starch, the germ and the bran by the processes employed in the manufacture of cornstarch and glucose. It may or may not contain corn solubles.

\**Corn Gluten Feed* is that portion of commercial shelled corn that remains after the separation of the larger part of the starch and the germ by the processes employed in the manufacture of cornstarch and glucose. It may or may not contain corn solubles.

\**Cottonseed Meal* is a product of the cottonseed only, composed principally of the kernel with such portion of the hull as is necessary in the manufacture of oil: *Provided* that nothing shall be recognized as cottonseed meal that does not conform to the foregoing definition and that does not contain at least 36 per cent of protein.

\**Choice Cottonseed Meal* must be finely ground, not necessarily bolted, perfectly sound and sweet in odor, yellow, free from excess of lint, and must contain at least 41 per cent of protein.

\**Prime Cottonseed Meal* must be finely ground, not necessarily bolted, of sweet odor, reasonably bright in color, yellow, not brown or reddish, free from excess of lint, and must contain at least 38.6 per cent protein.

\**Good Cottonseed Meal* must be finely ground, not necessarily bolted, of sweet odor, reasonably bright in color and must contain at least 36 per cent of protein.

\**Cottonseed Feed* is a mixture of cottonseed meal and cottonseed hulls, containing less than 36 per cent of protein.

\**Cold Pressed Cottonseed* is the product resulting from subjecting the whole undecorticated cottonseed to the cold pressure process for the extraction of oil, and includes the entire cottonseed less the oil extracted.

\**Ground Cold Pressed Cottonseed* is the ground produce resulting from subjecting the whole undecorticated cottonseed to the cold pressure process for the extraction of oil, and includes the entire ground cottonseed less the oil extracted.

*Wheat Bran* is the coarse outer coatings of the wheat berry obtained in the usual commercial milling process from wheat that has been cleaned and scoured.

*Shorts or Standard Middlings* are the fine particles of the outer and inner bran separated from bran and white middlings.

\**Wheat White Middlings or White Middlings* are that part of the offal of wheat intermediate between shorts or standard middlings and red dog.

*Shipstuff or Wheat Mixed Feed* is a mixture of the products other than the flour obtained from the milling of the wheat berry.

*Red Dog* is a low grade wheat flour containing the finer particles of bran.

\**Wheat Bran with Mill Run Screenings* is pure wheat bran plus the screenings which were separated from the wheat used in preparing said bran.

\**Wheat Bran with Screenings not Exceeding Mill Run* is either wheat bran with the whole mill run of screenings or wheat bran with a portion of the mill run of screenings, provided that such portion is not an inferior portion thereof.

*Cottonseed Feed.*—All mixtures of cottonseed meal and hulls containing less than 38.62 per cent protein shall be branded Cottonseed Feed, or a name may be given which does not contain the word "meal" or any other word that might be misleading.

[NOTE.—This definition of cottonseed feed, and not that of the Feed Control officials, is in force in this State.]

### HEARINGS.

When a sample of commercial feed examined shows variation from the guarantees, the dealer or manufacturer from whom the sample was taken shall be given an opportunity to be heard in his defense by the Commissioner before the facts may be certified to the proper prosecuting attorney.

It is the duty of the Department of Agriculture to regularly inspect the feeds offered for sale in the State and to see that all feeds bear the tax stamp and are properly labeled. The Department is required to collect and analyze at least one sample of every brand of feed found on sale in the State during the year and to publish the results for the benefit of those interested in this class of goods.

The Department will be glad, at any time, to furnish information regarding the character and value of any class of feed.

### TERMS USED IN ANALYSIS.

*Ash.* This is the incombustible part of the plant, earthy matter drawn from the soil by the plant, and taken over into the animal organism from plants.

*Protein.* This is the nitrogenous portion of the plant. Lean meat, white of eggs, curd of milk, gluten of grain are examples.

*Fiber.* The frame-work of the plant; trunk and stem are hardened fiber mixed with mineral and other matter; cotton is almost pure fiber.

*Fat.* The portion of plant soluble in ether is classed as fat, but includes small quantity of substances other than fats. Cotton-seed oil, olive oil, peanut oil, the oils of cereals are examples. Tallow, lard, butter and the various animal oils and fats fall into this class.

*Nitrogen-free Extract.* Starch, the various sugars, gums are examples.

*Carbohydrates.* This is a general term, including fiber and nitrogen-free extract.

### ANIMAL FEEDING AND NUTRITION.

A fundamental distinction between plants and animals is this: Plants manufacture, so to speak, foods; animals consume, but cannot manufacture, food. They merely transform—more or less modify—the food they get from plants, utilize it for their own growth and maintenance and for doing work, or else store it up in their bodies or, as in the case of milk, excrete it.

Animals get the mineral matter for forming bone from plants, a small portion also from water. The function of the carbohydrates and fats in animal nutrition is the production of warmth and energy; for this purpose fat has two and four-tenths the value of carbohydrate pound for pound. The function of protein is to build up, repair and sustain the vital portions of the animal organism,—blood, muscle, nerve, brain; the fats and carbohydrates cannot do this. Protein is capable also of being oxidized, or burned, in the body and producing warmth and energy; and in the absence of adequate fats and carbohydrates is thus utilized; but this is, beside being extravagant, unwholesome. A well balanced ration is one that contains protein, fat, carbohydrate in proper proportion to meet the needs of the animal. These needs vary with the kind of animal, its age and uses.

The following are excellent hand-books on animal feeding and nutrition:—

“Feeds and Feeding” by Prof. W. A. Henry; “Profitable Stock Feeding” by Prof. H. W. Smith; “Manual of Cattle Feeding” by Prof. H. P. Amnby; “The Feeding of Animals” by W. H. Jordan.

### COMPOSITION OF SOME PURE UNADULTERATED FEEDING STUFFS.

Compiled from “*Henry’s Feeds and Feeding*,” whose tables are taken mainly from Farmers’ Bulletin 22, U. S. Dept. of Agriculture

By comparing the analyses in this table with the analyses of feeding stuffs, collected in this State, whose analyses are published in this BULLETIN, one may gain an idea of the purity and worth of these feeding stuffs.

## UNADULTERATED FEEDING STUFFS

	Percentage Composition		
	Protein	Fat	Fiber
Corn, dent.....	10.3	5.0	2.2
Flint.....	10.5	5.0	1.7
Meal.....	9.2	3.8	1.9
Cob.....	2.4	0.5	30.1
Bran.....	9.0	5.8	12.7
Wheat.....	11.9	2.1	1.8
Bran.....	15.4	4.0	9.0
Middlings.....	15.6	4.0	4.6
Shorts.....	14.9	4.5	7.4
Screenings.....	12.5	3.0	4.9
Oats.....	11.8	5.0	9.5
Hulls.....	3.3	1.0	29.7
Rice.....	7.4	0.4	0.2
Hulls.....	3.0	0.7	35.7
Bran.....	12.1	8.8	9.5
Polish.....	11.7	7.3	6.3
Cotton-seed Meal.....	42.3	13.1	5.6
Hulls.....	4.2	2.2	46.3
Cowpea.....	20.8	1.4	4.1
Fodder corn, field cured.....	4.5	1.6	14.3
Green.....	1.8	0.5	5.0
Corn stover, field cured.....	3.8	1.1	19.7
Husks, field cured.....	2.5	0.7	15.8
Leaves, field cured.....	6.0	1.4	21.4
Hay from mixed grasses.....	7.4	2.5	27.2
Kentucky blue grass.....	7.8	3.9	23.0
Red clover.....	12.0	3.3	24.0
In bloom.....	12.4	4.5	33.8
Alfalfa.....	14.3	2.2	25.0
Pea vine.....	13.7	2.3	24.7
Peanut vines (without nuts).....	10.7	4.6	23.6
Wheat straw.....	3.4	1.3	38.1
Oat straw.....	4.0	2.3	37.0
Chaff.....	4.0	1.5	34.0
Wheat chaff.....	4.5	1.4	36.0
Corn silage.....	1.7	0.8	6.0

	Percentage Composition			
	Water	Protein	Fat	Fiber
Potato.....	78.9	2.1	0.1	0.6
Sweet potato.....	71.0	1.5	1.3	0.4
Beets.....	88.5	1.5	0.1	0.9
Turnip.....	90.5	1.1	0.2	1.2
Carrots.....	88.6	1.1	0.4	1.3
Cabbage.....	90.5	2.4	0.4	1.5
Beet pulps.....	89.8	0.9	---	2.4

## ADULTERANTS.\*

The following materials, when mixed with feeds without sufficient labeling to indicate their presence are considered adulterants: corn bran, rice hulls, ground corncobs, peanut hulls, peanut middlings, oat hulls, mill sweepings, screenings, cotton-seed hulls, and similar products.

## ANALYSES OF FEED ADULTERANTS

	Protein (N x 6.25) %	Fat (Ether Extract) %	Fiber %	Nitrogen- free Extract %	Water %	Ash %
Corn bran.....	7.00	2.82	11.89	65.44	11.08	1.77
Rice hulls.....	3.60	0.70	35.70	38.60	8.20	† 13.20
Corn cobs.....	2.40	0.50	30.10	54.90	10.70	† 1.40
Peanut hulls.....	4.56	0.81	67.31	-----	-----	2.17
Spanish peanut hulls.....*	10.12	2.70	31.33	29.98	5.89	19.98
Peanut middlings.....	8.75	0.88	40.75	-----	-----	16.75
Oat hulls.....	2.63	1.08	31.49	53.83	5.64	5.33
Wheat screenings.....	13.88	2.80	3.49	64.71	10.75	4.37
Cottonseed hulls with lint.....	3.25	1.12	46.92	40.11	6.05	2.55
Cottonseed hulls, delinted.....	2.40	0.31	36.49	50.22	8.20	2.38

## WHEAT BRAN.

(Analyses on pages 24-29.)

Fifty-seven samples of wheat bran were analyzed, of which 49, or 86 per cent, were official. The following tabulation will give at a glance the results of the analyses:

	Percentage Composition		
	Protein	Fat	Fiber
Guarantee.....	13.75 to 17.13	3.00 to 5.35	4.71 to 11.00
Found.....	12.50 to 16.38	2.66 to 6.12	4.86 to 10.58
Deficient†.....	21 or 43.00	11 or 22	39 or 80
Range of deficiency.....	0.07 to 3.76	0.06 to 1.34	0.05 to 3.42
Range of excess.....	0.06 to 3.63	0.01 to 1.95	0.50 to 1.55
Average deficiency.....	-----	-----	-----
Average excess.....	-----	-----	-----

It will thus be seen that the article sold as wheat bran varies greatly in feeding value—as much as 30 per cent in protein and 100 per cent in fat. This variation is not due, except in rare cases, to adulteration. There is, however, no adequate variation in price to correspond with greater or less feeding value. The price of wheat bran throughout the State the past year was \$1.60, \$1.65, \$1.70, and \$1.75 per 100 lbs. The same dealer, in the same town, on the same day, quoted bran:

\*Reprinted from Bulletin of November, 1912.

†Deficient here, and throughout this bulletin, means below guarantee; and note that to be below guarantee in the case of fiber is to be better than guarantee.

	Percentage Composition			
		Protein	Fat	Fiber
\$1.75 per 100 pounds.....	{ Guaranteed.....	16.00	5.00	6.00
	{ Found.....	16.37	4.65	4.86
\$1.60 per 100 pounds.....	{ Guaranteed.....	17.13	4.09	6.50
	{ Found.....	13.50	4.19	6.82

In the first case, a dollar would buy 9.3 pounds of protein and 2.6 pounds of fat; whereas in the case of the lower-priced article, owing to its inferior quality, a dollar would buy 8.4 pounds of protein and 2.6 pounds of fat. If the first, or higher priced, goods was worth \$1.75 per 100 pounds, the lower priced goods was worth not \$1.60 but \$1.44 per 100 pounds. It must not be inferred that the inferiority of the latter was due to adulteration; it was not; the goods was what is claimed to be, pure wheat bran. A compilation by the U. S. Dept. of Agriculture of 88 analyses of wheat bran gives the following range of constituents.\*

	Percentage Composition		
	Protein	Fat	Fiber
-----	12.1 to 18.9	1.5 to 7.0	2.4 to 15.5
Average.....	15.4	4.0	9.0

### WHEAT MIDLINGS, SHORTS, RED DOG.

(Analyses, pages 30-35.)

Seventy samples, of which sixty-three are official, are reported here. Their range of composition is shown in the following tabulation:

	Percentage Composition		
	Protein	Fat	Fiber
Guaranteed.....	10.00 to 19.00	3.00 to 6.00	2.13 to 11.00
Found.....	13.00 to 19.50	2.35 to 6.83	1.20 to 9.02
Deficient.....	11 or 17	13 or 20.5	53 or 84
Range of deficiency.....	0.02 to 2.12	0.01 to 2.15	0.08 to 5.61
Range of excess.....	0.25 to 5.00	0.02 to 2.00	0.10 to 1.98

Here, also, is a wide range of feeding value: but prices do not vary according to feed value. The following tabulation will show this discrepancy between price and feeding value:

\*Bulletin No. 11; 1892.

			Percentage Composition		
			Protein	Fat	Fiber
April 16, 1914.....	\$1.80 per 100 pounds..	{ Guaranteed.....	19.02	5.33	4.38
		{ Found.....	19.50	5.58	3.90
March 31, 1914.....	2.00 per 100 pounds..	{ Guaranteed.....	16.00	4.50	7.00
		{ Found.....	17.75	4.65	1.39

Both these samples are *Red Dog* (Minnesota goods); each is high grade, better than it is guaranteed to be. The first, quoted at \$1.80 per hundred pounds, is quite appreciably better than the latter, although it was quoted 20 cents higher.

Red Dog was quoted the past year at \$1.80, \$1.90, \$1.95, \$2.00 per 100 pounds.

Shorts or middlings were quoted at \$1.60 by leaps of 5 cents all the way up to \$2 per 100 pounds. Here also prices do not vary with feeding value, as witness the following:

			Percentage Composition		
			Protein	Fat	Fiber
January 20, 1914.....	\$1.60 per 100 pounds..	{ Guaranteed.....	16.00	4.50	4.00
		{ Found.....	18.00	4.80	2.27
June 16, 1914.....	2.00 per 100 pounds..	{ Guaranteed.....	15.00	4.00	4.00
		{ Found.....	15.50	3.78	2.73
June 16, 1914.....	1.60 per 100 pounds..	{ Guaranteed.....	15.00	5.00	9.00
		{ Found.....	16.88	5.60	6.57

Here are two quotations on the same day, June 16, and they were made in the same town. This indicates that the man who on that day paid \$2 per 100 pounds for his middlings could have gotten a better article "just around the corner" for \$1.60.

### MIXTURES OF BRAN, SHORTS AND SCREENINGS.

(Analyses, pages 36, 37.)

The number analyzed is seventeen, eleven being official. The variation in composition is indicated below:

	Percentage Composition		
	Protein	Fat	Fiber
Guaranteed.....	14.50 to 17.50	4.00 to 5.02	6.00 to 12.00
Found.....	13.37 to 16.38	3.50 to 5.32	4.43 to 9.08
Deficient.....	6 or 55	5 or 45	11 or 100
Range of deficiency.....	1.12 to 3.12	0.06 to 0.76	0.45 to 3.14
Range of excess.....	0.06 to 2.30	0.05 to 0.90	.....

# TRADE-NAME MIXTURES OF WHEAT BRAN, MIDDINGS AND SCREENINGS.

(Analyses, page 38, 39.)

Fifteen samples, all official, were analyzed.

	Percentage Composition		
	Protein	Fat	Fiber
Guarantee.....	14.00 to 16.00	3.83 to 4.50	7.00 to 9.10
Found.....	13.63 to 17.00	3.27 to 5.42	3.82 to 7.08
Deficient.....	7 or 46.6	6 or 40	15 or 100
Range of deficiency.....	0.12 to 1.38	0.02 to 0.73	0.74 to 4.18
Range of excess.....	0.13 to 1.00	0.05 to 1.42	0.00 to 0.00

## SHIPSTUFF.

(Analyses, pages 40-43.)

Twenty-six official and four unofficial samples are reported. The range in composition summarizes as follows:

	Percentage Composition		
	Protein	Fat	Fiber
Guaranteed.....	14.00 to 16.00	4.00 to 5.00	2.57 to 7.00
Found.....	14.12 to 17.38	3.55 to 5.90	4.14 to 7.13
Deficient.....	6 or 23	11 or 42	19 or 73
Range of deficiency.....	0.25 to 0.75	0.03 to 1.12	0.14 to 1.62
Range of excess.....	0.13 to 1.76	0.03 to 1.54	0.04 to 2.88

The prices quoted on Shipstuff the past year were \$1.70, \$1.75, \$1.80, \$1.85, \$2.

The following quotations were given in the same town on two consecutive days by different firms:

		Percentage Composition			
			Protein	Fat	Fiber
March 30, 1914.....	\$1.70 per 100 pounds..	{ Guaranteed.....	15.00	4.00	6.00
		{ Found.....	17.38	5.35	5.45
March 31, 1914.....	2.00 per 100 pounds..	{ Guaranteed.....	16.00	4.00	5.00
		{ Found.....	16.50	4.65	5.36

If the first was worth only \$1.70, the second should have sold not for \$2, but for \$1.61 or thereabout.

## MIXED FEEDS NOT CONTAINING MOLASSES.

(Analyses, pages 44-49.)

Forty-seven official and twelve unofficial samples were analyzed, These feeds vary greatly in value.

	Percentage Composition		
	Protein	Fat	Fiber
Guaranteed.....	8.75 to 19.00	2.00 to 8.00	1.75 to 15.00
Found.....	7.50 to 19.00	1.22 to 8.02	1.05 to 18.97
Deficient.....	17 or 36	26 or 55	34 or 72
Range of deficiency.....	0.12 to 3.37	0.03 to 1.77	0.05 to 4.53
Range of excess.....	0.11 to 2.88	0.02 to 1.02	0.16 to 3.97

The prices asked for these feeds range from \$1.65 to \$2 per 100 pounds. In as much as they are compounded, it is to be expected that their prices will be fixed according to their feeding value. The following two feeds carry out this idea in a measure. The first consisted of crushed oats and cracked corn. The second of oats and cracked corn:

			Percentage Composition		
			Protein	Fat	Fiber
January 12, 1914-----	\$2.00 per 100 pounds..	{ Guaranteed-----	10.00	4.50	6.50
		{ Found-----	10.88	3.80	4.76
January 14, 1914-----	1.85 per 100 pounds..	{ Guaranteed-----	9.38	4.38	3.25
		{ Found-----	9.50	3.32	3.20

If the last is worth \$1.85, the first should be worth about \$2.12.

The following two quotations illustrate the great difference in feeding value between goods that sell sometimes at the same price.

		Percentage Composition			
			Protein	Fat	Fiber
June 16, 1914.....	\$1.75 per 100 pounds..	{ Guaranteed.....	8.75	2.75	1.75
		{ Found.....	7.50	1.22	1.05
June 18, 1914.....	1.75 per 100 pounds..	{ Guaranteed.....	16.50	3.50	14.00
		{ Found.....	15.63	3.07	9.75

The first claimed to be "corn goods," and consisted mainly of corn meal. The latter consisted of corn, cotton-seed meal, alfalfa, and oat clips. On the face of the analysis, the last should have about twice the feeding value of the first named; but difference in digestibility would reduce it to much less than that, possibly to one and a half. The dry matter in corn meal is stated to be 88 per cent digestible; that in cotton-seed meal, alfalfa and oat chaff 76 per cent., 60 per cent., and 42 per cent, respectively.

## MIXED FEEDS CONTAINING MOLASSES.

(Analyses, pages 50-57.)

Sixty-nine samples are reported, of these sixty-three were collected by the official inspector. The guarantees and analyses range as follows:

	Percentage Composition		
	Protein	Fat	Fiber
Guaranteed.....	8.00 to 16.50	0.50 to 4.00	10.00 to 26.00
Found.....	8.12 to 17.81	0.87 to 7.28	5.22 to 16.60
Deficient.....	24 or 33	29 or 46	50 or 79
Range of deficiency.....	0.25 to 1.75	0.08 to 1.42	0.16 to 11.00
Range of excess.....	0.13 to 4.50	0.07 to 3.78	0.05 to 3.60

The price of these goods ranged from \$1.60 to \$2 per 100 pounds; in one case \$2.25 was asked. Note the following quotations as compared to feeding value:

		Percentage Composition			
			Protein	Fat	Fiber
March 30, 1914.....	\$2.00 per 100 pounds..	{ Guaranteed.....	10.00	3.00	12.50
		{ Found.....	9.50	2.32	10.31
March 31, 1914.....	2.00 per 100 pounds..	{ Guaranteed.....	10.00	2.00	12.00
		{ Found.....	12.38	2.56	13.17

The ingredients, except a little salt in the first, are the same, namely, alfalfa, cracked corn, oats, molasses; the guarantees are about the same, except as to fat. But the analysis indicates the last to be of appreciably greater feed value than the first. The foregoing quotations were in the same town. Take two other illustrations in the same town at about the same date as the foregoing:

		Percentage Composition			
			Protein	Fat	Fiber
March 30.....	\$1.75 per 100 pounds..	{ Guaranteed.....	10.00	2.50	12.00
		{ Found.....	11.50	1.68	11.25
March 30.....	1.90 per 100 pounds..	{ Guaranteed.....	15.00	3.00	12.00
		{ Found.....	15.38	3.12	13.51

If the first was worth \$1.75 per 100 pounds, the latter should, on the face of the analysis, be worth about \$2.35 or \$2.40. In the first case a dollar bought 6.6 pounds of protein and supposedly 1.4 pounds of fat, but actually barely 1 pound; in the latter case 8.7 pounds of protein and 1.6 pounds of fat. The ingredients of the first were alfalfa, cotton-seed meal, corn, molasses, oats: the ingredients of the last were the same

except rice straw instead of oats. There could, however, have been but little rice straw present, else the protein content would have been less and the fiber content greater; rice straw contains but little protein (4.7%), much fiber (3%) and little fat (2%).

### POULTRY FEEDS.

Analyses, pages 58-61.)

• Twenty-six samples were analyzed. The range of guarantee and analysis stood thus:

	Percentage Composition		
	Protein	Fat	Fiber
Guaranteed.....	9.00 to 19.57	2.50 to 5.00	3.00 to 9.00
Found.....	9.25 to 19.63	1.99 to 5.33	1.80 to 6.62
Deficient.....	4 or 16	7 or 29	23 or 96
Range of deficiency.....	0.25 to 0.87	0.15 to 1.51	0.09 to 6.21
Range of excess.....	0.06 to 2.25	0.01 to 1.89	

The prices asked for poultry feed ranged from \$2 to \$3 per 100 pounds. The following quotations will indicate that this difference in price is not always justified by difference in feed value:

			Percentage Composition		
			Protein	Fat	Fiber
March 30, 1914.....	\$2.00 per 100 pounds..	{ Guaranteed.....	10.00	3.00	5.00
		{ Found.....	12.25	3.31	2.57
May 25, 1914.....	3.00 per 100 pounds..	{ Guaranteed.....	12.00	3.00	4.00
		{ Found.....	12.00	3.00	3.52
June 16, 1914.....	2.50 per 100 pounds..	{ Guaranteed.....	10.00	3.50	4.00
		{ Found.....	10.63	2.82	2.01

Ingredients of the first: cracked corn, kafir corn, wheat, buckwheat.

Ingredients of the second: corn meal, gluten, middlings, bran, oatmeal, hen-e-ta.

Ingredients of the third: cracked corn, kaffir corn, wheat, shells.

The two dollar stuff is undoubtedly better than the two-fifty stuff, and probably little inferior to the three-dollar stuff. Hen-e-ta is a phosphatic grit, for which great claims are made.

### COTTON-SEED MEAL AND COTTON-SEED FEED.

(Analyses, pages 62-65.)

The official samples of cotton-seed meal are collected mainly by the inspectors of fertilizers, and the analyses are published in the fertilizer bulletins, hence only very few are reported here. Standard cotton-seed meal is defined by our cotton-seed meal law to be one that contains

7.5% of ammonia, equivalent to 6.18% nitrogen, and 38.62% protein. If the goods contain less than 38.62% of protein, it must be branded "Cotton-seed Feed," or be designated by a name that does not contain the word "meal."

Two of the three official samples of meal reported here were 1.07% and 2.25% below guarantee (38.56%).

Five unofficial samples, sent in for analysis by private citizens, ranged from 31.88% to 39.8% protein, one only being above guarantee.

Six official samples of cotton-seed feed were guaranteed to contain 20 to 25% protein and were found to contain 20.63% to 27.76% of protein.

Lumping the cotton-seed meals and cotton-seed feeds together, they range as follows in guarantee and analysis:

	Percentage Composition		
	Protein	Fat	Fiber
Guaranteed.....	20.00 to 38.56	3.00 to 6.00	12.00 to 23.00
Found.....	16.87 to 39.87	3.83 to 9.49	7.78 to 24.80
Deficient.....	4 or 36	3 or 43	7 or 100
Range of deficiency.....	0.75 to 3.94	0.25 to 0.59	1.50 to 4.73
Range of excess.....	0.56 to 4.50	0.65 to 3.25	

### CORN, CRACKED CORN, CORN CHOPS, CORN BRAN.

(Analyses, pages 66, 67.)

Whole corn, or other grains, when unmixed, are not subject to the feed control law; one analysis (corn), however, is given here. Thirteen other analyses are reported, seven being of official samples. The cracked corn, imported into the State, was properly guaranteed; but there seems to be a tendency on the part of some manufacturers in the State to neglect this. However, the unguaranteed samples were of rather higher grade than the guaranteed. The range of guarantee and analysis (cracked corn) is as follows:

	Percentage Composition		
	Protein	Fat	Fiber
Guaranteed.....	8.00 to 8.75	3.00 to 4.53	1.99 to 6.00
Found.....	7.38 to 8.75	2.46 to 3.84	1.64 to 2.06
Deficient.....	2 or 50	3 or 75	4 or 100
Range of deficiency.....	0.62 to 0.75	0.54 to 1.01	0.04 to 3.98
Range of excess.....	0.50 to 0.75	0.00 to 0.26	0.00 to 0.00

One sample, corn chops (133), was found to be abnormally high in fat (7.20 per cent).

**GLUTEN FEED, DRIED BEET PULP.**

(Analyses, pages 68, 69.)

Only one analysis of gluten feed is recorded. This feed is rich in protein, guaranteed 23 per cent, found 27 per cent.

Dried beet pulp, on the other hand, is low in protein and fat, high in fiber. The price asked for it—\$1.75 to \$2 per 100 pounds—would seem to be entirely too much for its feed value.

	Percentage Composition		
	Protein	Fat	Fiber
Guaranteed.....	8.00	0.50	20.00
Found.....	7.25 to 8.94	0.57 to 1.00	17.18 to 19.10
Deficient.....	1 or 80	-----	4 or 100
Range of deficiency.....	0.25	-----	0.90 to 2.53
Range of excess.....	1.63 to 94	0.07 to 0.05	0.00 to 0.00

**RICE PRODUCTS.**

(Analyses, page 70.)

Three samples, unofficial, sent by the manufacturer, were analyzed. Except a trivial deficiency (0.13 per cent) in protein, these feeds are all above guarantee. They are notably rich in fats.

**POULTRY AND STOCK TONICS.**

(Analyses, pages 70, 71.)

Four samples were analyzed. We get a good many enquiries as to the value of these stuffs. We cannot do better than repeat the advice given by Professor Henry of the Agricultural Department of the University of Wisconsin:

"As to these nostrums it may be said that vigorous, healthy animals do not make better use of their feed because of their addition. If animals are out of condition they should receive specific treatment according to their ailments. A good manager of live stock will have no use for these high-priced condimental foods or condition powders; a poor manager will never have fine stock by employing them."

Some enquirers reveal a fear that these condiments may sometimes contain ingredients that are harmful. This is doubtless never the case, especially in view of the small quantities, or doses, in which they are administered. Their main body consists, as a rule, of one or more ordinary feed stuffs of standard value, including the following: "Corn, corn meal, hominy, feed corn, gluten meal, oats, hulled oats, wheat, wheat middlings, wheat bran, baked and kiln-dried rolled wheat, cotton-seed meal, linseed oil meal, crackers, alfalfa meal, meat meal, dried bone meal, dried beef and bone, beef scrap, dried blood, starch. Among the constituents of more or less medicinal value are: gentian, ginger, anise seed, fennigreek, mustard seed, pepper, fennel seed, rape seed, caraway seed, licorice, nuxvomica, cinchona bark, rosin, columbo, elecampane,

quassia, senna leaves, belladonna root, sassafras, camphor, epsom salts, table salt, glauher's salt, saltpeter, borax, copperas, soda, sodium hypsulphite, charcoal, sulphur, limestone, oyster shells, ferric oxide (Venetian red).

A particular tonic will, of course, contain only a few of the foregoing ingredients.

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"THE MAINE MIXTURE costs but 20 cents a pound; is concentrated instead of diluted, is all drug and not mostly feed stuff, and, hence, far stronger. It is probably at least as efficient as, and certainly far cheaper than, the generality of condimental feeds. The Maine Station suggests: Pulverized gentian, one pound; pulverized ginger, one-quarter pound; pulverized saltpeter, one-quarter pound; pulverized iron sulphate (copperas) one quarter pound. Mix; feed tablespoonful in feed once daily for ten days; omit three days; feed as above for ten days more."—*From Bulletin No. 164, Vermont Experiment Station.*

#### POULTRY FEEDS IN SMALL PACKAGES.

Poultry feeds may be put up in small bags, boxes or other containers of less than 25 pounds net weight: *Provided first*, That these containers be labeled with their net weight and the other usual guarantees; and, *Provided further*, That these smaller packages be enclosed in a larger bag or container of standard net weight of 25, 50, 75, etc., pounds; the said larger container to bear the requisite tax stamp and guarantees.

## ANALYSES OF SAMPLES

## ANALYSES OF

Laboratory Number	Brand Name form Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price
288	Pure Wheat Bran.....	Akin-Erskine Milling Co., Evansville, Ind.	Charlotte Brokerage Co., Charlotte	June 10, '14	100	\$1.70
155	do.....	Ballard & Ballard, Louis- ville; Ky.	Hazel & Mimms, Reids- ville.	Jan. 20, '14	100	1.60
142	do.....	Blank & Gottshall, Sun- bury, Pa.	Pippin & Woolard, Wash- ington.	Jan. 12, '14	100	-----
120	Big Diamond Bran.....	Big Diamond Mills Co., Minneapolis, Minn.	S. M. Savage, Greenville...	Nov. 11, '13	100	1.75
107	do.....	do.....	G. T. Sullivan, Kinston...	Nov. 8, '13	100	-----
137	Wheat Bran.....	Star and Crescent Mill- ing Co., Chicago, Ill.	C. B. Hill, New Bern.....	Jan. 10, '14	100	1.75
55	Pure Wheat Bran.....	Dan Valley Mills, Dan- ville, Va.	Farmers' Union Agency Co., Winston-Salem.	Sept. 9, '13	100	1.75
75	Wheat Bran.....	The Dunlop Mills, Rich- mond, Va.	G. C. Lovell, Mt. Airy.....	Oct. 16, '13	100	1.60.
108	Arrow Wheat Bran.....	do.....	G. T. Sullivan, Kinston...	Nov. 8, '13	100	-----
226	Wheat Bran.....	do.....	The Patterson Co., Greensboro.	Mar. 30, '14	100	1.60
308	do.....	Gwinn Milling Co., Co- lumbus, O.	W. H. Turner, Winston- Salem.	June 16, '14	100	1.75
0	Pure Wheat Bran.....	Harrisonburg Milling Co., Harrisonburg, Va.	Dorton Grain & Produce Co., Concord, R. F. D. 2.	-----	100	-----
1	Wheat Bran.....	do.....	Phillips & Penny.....	Sept. 10, '13	100	1.60
2	do.....	do.....	Lowe Bros. & Co., Kan- napolis.	Sept. 16, '13	100	1.60
3	Pure Wheat Bran.....	do.....	Dorton Grain & Produce Co., Concord, R. F. D. 2.	Sept. 17, '13	100	-----
41	do.....	do.....	Elmore Maxwell Co., Greensboro.	Sept. 9, '13	100	1.60
42	Wheat Bran.....	do.....	The Patterson Co., Greens- boro.	Sept. 22, '13	100	1.65
80	Pure Wheat Bran.....	do.....	W. A. Myatt, Raleigh.....	Oct. 23, '13	100	1.60
81	do.....	do.....	Peebles Bros., Raleigh.....	Oct. 23, '13	100	1.60
117	Wheat Bran.....	do.....	Job P. Wyatt & Sons Co., Raleigh.	Nov. 21, '13	100	1.65
43	Pure Wheat Bran.....	Holt-Granite Mfg. Co., Haw River, N. C.	Southern Feed & Grocery Co., Durham.	Sept. 10, '13	75	1.25
249	Wheat Bran.....	Hecker-Jones-Jewell Mill- ing Co., New York.	H. L. Bizzell, Goldsboro...	-----	100	1.70
93	Choice Bran.....	do.....	Chas. Schaefer & Son, Wilmington.	Nov. 8, '13	100	1.60
94	Wheat Bran.....	do.....	John McEachern Sons, Wilmington.	Nov. 8, '13	100	1.60
102	Hecker Choice Bran.....	do.....	H. L. Bizzell, Goldsboro...	Nov. 6, '13	100	1.75
197	Wheat Bran.....	Horen-Johnston Co., Mocksville, N. C.	W. M. Neel & Co., Mooresville.	Mar. 25, '14	100	1.60

Note: When the discrepancy between "guaranteed" and "found" is below guarantee, that fact is indicated

## OF FEEDS, SEASON 1913-1914

## WHEAT BRAN

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
288	{ Guaranteed.....	15.50		4.00		9.50			
	{ Found.....	14.88	-.62	4.45	.45	7.91	-1.59	Pure wheat bran.....	As guaranteed.
155	{ Guaranteed.....	14.97		4.10		9.50			
	{ Found.....	14.50	-.47	4.35	.25	8.17	-1.33	do.....	do.
142	{ Guaranteed.....	16.00		4.50		7.50			
	{ Found.....	14.13	-1.87	4.67	.17	8.50	1.00	do.....	do.
120	{ Guaranteed.....	14.00		4.00		11.00			
	{ Found.....	15.50	1.50	4.95	.95	10.47	-.53	do.....	do.
107	{ Guaranteed.....	14.00		4.00		11.00			
	{ Found.....	15.00	1.00	4.86	.86	10.44	-.56	do.....	do.
135	{ Guaranteed.....	15.00		4.00		10.00			
	{ Found.....	15.38	.38	4.82	.82	10.58	.58	do.....	do.
55	{ Guaranteed.....	16.00		5.00		6.00			
	{ Found.....	16.37	.37	4.65	-.35	4.86	-1.14	do.....	do.
75	{ Guaranteed.....	14.50		4.00		9.50			
	{ Found.....	15.12	.62	4.04	.04	7.57	-1.93	Wheat Bran.....	do.
105	{ Guaranteed.....	14.50		4.00		9.50			
	{ Found.....	14.88	.38	4.62	.62	7.55	-1.95	Wheat bran and ground screenings.....	do.
226	{ Guaranteed.....	14.75		4.00		9.50			
	{ Found.....	15.25	.50	4.80	.80	7.61	-1.89	Wheat bran.....	do.
308	{ Guaranteed.....	15.00		4.00		8.00			
	{ Found.....	14.13	-.87	4.47	.47	9.03	1.03	do.....	do.
0	{ Guaranteed.....	14.50		4.00		9.50			
	{ Found.....	13.49	-1.00	4.36	.36	8.83	-.67	Pure wheat bran.....	Wheat bran, straw, corn-cockle.
1	{ Guaranteed.....	14.50		4.00		9.50			
	{ Found.....	14.00	-.50	3.23	-.77	6.71	-2.79	do.....	Wheat bran and corn bran (little).
2	{ Guaranteed.....	14.50		4.00		9.50			
	{ Found.....	14.75	.25	4.06	.06	7.85	-1.65	do.....	do.
3	{ Guaranteed.....	14.50		4.00		9.50			
	{ Found.....	14.00	-.50	4.22	.22	8.22	-1.28	Pure wheat bran.....	Wheat bran and some screenings.
41	{ Guaranteed.....	14.50		4.00		9.50			
	{ Found.....	14.56	.06	4.01	.01	6.08	-3.42	do.....	Wheat bran and whole wheat (21%).
42	{ Guaranteed.....	14.50		4.00		9.50			
	{ Found.....	13.88	-.63	4.06	.06	7.14	-2.36	Wheat bran.....	Wheat bran, some corn bran and screenings.
80	{ Guaranteed.....	14.50		4.00		9.50			
	{ Found.....	14.87	.33	4.20	.20	7.97	-1.53	Pure wheat bran.....	As guaranteed.
81	{ Guaranteed.....	14.50		4.00		9.50			
	{ Found.....	15.25	.75	3.64	-.36	7.70	-1.80	do.....	do.
117	{ Guaranteed.....	14.50		4.00		9.50			
	{ Found.....	15.12	.72	3.94	-.06	8.19	-1.31	Pure wheat products....	do.
43	{ Guaranteed.....	14.00		3.75		9.50			
	{ Found.....	13.38	-.62	4.04	.29	7.48	-2.02	do.....	Wheat bran and small quantity of middlings.
249	{ Guaranteed.....	15.45		4.49		8.95			
	{ Found.....	15.38	-.07	4.90	.41	9.45	.50	Wheat bran.....	As guaranteed.
93	{ Guaranteed.....	14.95		5.35		9.50			
	{ Found.....	15.87	.92	4.75	.60	7.81	-1.69	do.....	do.
94	{ Guaranteed.....	16.04		4.26		9.10			
	{ Found.....	15.25	-.79	5.11	.85	7.98	-1.12	do.....	do.
102	{ Guaranteed.....	14.95		3.35		9.50			
	{ Found.....	15.75	.80	4.40	1.05	8.05	-1.45	do.....	do.
197	{ Guaranteed.....	13.75		3.00		6.25			
	{ Found.....	14.63	.88	4.60	1.60	6.77	.52	do.....	do.

by —. In all other cases the discrepancy is above guarantee.

## ANALYSES OF

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price
71	Pure Wheat Bran.....	Lynchburg Milling Co., Lynchburg, Va.	C. H. Hunter, Roxboro....	Oct. 8, '13	100	\$1.60
70	do.....	do.....	Hugh Woods, Roxboro....	Oct. 8, '13	100	1.60
52	do.....	J. D. Manor & Co., New Market, Va.	Elmore Maxwell & Co., Greensboro.	Sept. 9, '13	100	1.60
159	do.....	do.....	Hazell & Mimms, Reidsville.	Jan. 20, '14	100	1.60
126	do.....	Mountain City Mill Co., Chattanooga, Tenn.	Slayden Fakes & Co., Asheville.	Nov. 24, '13	75	1.30
124	do.....	do.....	W. S. Ashworth & Son, Brevard.	Nov. 24, '13	75	1.50
109	Seal of Minnesota Bran...	New Prague Flour Mill Co., New Prague, Minn.	Ray Dawson, Kinston....	Nov. 8, '13	100	1.65
6	Pure Wheat Bran.....	North Western Consolidated Milling Co., Minneapolis, Minn.	-----	-----	-----	-----
48	do.....	Piedmont Mills, Lynchburg, Va.	Elmore Maxwell Co., Greensboro.	Sept. 9, '13	100	1.60
161	do.....	do.....	Spray Mercantile Co., Spray.	Jan. 20, '14	100	1.65
39	Wheat Bran.....	Pillsbury Mills, Minneapolis, Minn.	C. G. Morris & Co., Washington.	Jan. 12, '14	100	-----
83	Wheat Bran.....	do.....	A. E. Rankin & Co., Fayetteville.	Nov. 6, '13	100	1.60
8	Wheat Bran.....	J. S. Read, Morristown, Tenn.	Asheville Grocery Co., Asheville.	July 18, '13	75	-----
299	do.....	South Side Roller Mills, Winston-Salem, N. C.	Farmers' Union Agency, Winston-Salem.	June 16, '14	100	1.70
4	do.....	do.....	J. G. Missick, Winston-Salem.	July 10, '13	-----	-----
5	Wheat Bran.....	do.....	Angels Bros., Winston-Salem.	July 10, '13	-----	-----
7	do.....	South River Milling Co., Salisbury, N. C.	Salisbury Grain & Feed Co., Salisbury.	July 12, '13	100	-----
48	do.....	South Side Roller Mills, Winston-Salem, N. C.	Farmers' Union Agency, Winston-Salem.	Sept. 9, '13	100	1.60
285	do.....	J. J. Wallace, Rusk, N. C.	R. M. Chatham, Elkin....	May 26, '14	-----	-----
97	do.....	W. A. Watson & Co., Greensboro.	C. C. Shores & Co., Rockingham.	Nov. 11, '13	100	1.60
85	do.....	Washburn-Crosby Co., Minneapolis, Minn.	J. H. Culbreth & Co., Fayetteville.	Nov. 6, '13	100	1.60
273	Pure Wheat Bran.....	do.....	G. C. Lovell Co., Mt. Airy.	May 14, '14	100	1.75
91	Coarse Bran.....	do.....	The D. L. Gore Co., Wilmington.	Nov. 8, '13	100	1.60
45	Pure Coarse Wheat Bran	do.....	Winston Grain Co., Winston-Salem.	Sept. 9, '13	100	1.50
271	Pure Wheat Bran.....	R. E. Zimmerman, Rural Hall, N. C.	E. L. Kiser & Co., Rural Hall.	May 13, '14	-----	-----
6555	do.....	J. D. Anderson, Tobaccoville, N. C.	Sent by J. D. Anderson, Tobaccoville.	Mar. —, '14	-----	-----
6542	do.....	Milton Mill Co., Milton, N. C.	Sent by N. C. Brandon, Yanceyville.	Dec. —, '13	-----	-----

## WHEAT BRAN—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
71	{ Guaranteed..	14.50		4.00		9.50			
	{ Found.....	14.25	— .25	4.38	.38	8.30	—1.20	Wheat bran.....	As guaranteed.
70	{ Guaranteed..	14.50		4.00		9.50			
	{ Found.....	13.37	—1.13	4.01	.01	9.11	— .39	do.....	do.
52	{ Guaranteed..	15.75		4.00		7.95			
	{ Found.....	15.88	.13	2.66	—1.34	7.48	— .47	do.....	do.
159	{ Guaranteed..	15.75		4.00		7.95			
	{ Found.....	15.13	— .62	3.87	— .13	7.90	— .05	do.....	do.
126	{ Guaranteed..	14.50		4.00		9.50			
	{ Found.....	14.75	.25	4.42	.42	8.15	—1.35	do.....	do.
124	{ Guaranteed..	14.50		4.00		9.50			
	{ Found.....	14.38	— .12	4.31	.31	8.00	—1.50	do.....	do.
109	{ Guaranteed..	14.60		4.75		11.00			
	{ Found.....	15.50	.90	4.78	.03	9.84	—1.16	do.....	do.
6	{ Guaranteed..								
	{ Found.....	14.00		4.19		8.27		do.....	do.
48	{ Guaranteed..	14.50		4.00		9.50			
	{ Found.....	14.13	— .37	4.80	.80	8.63	— .87	do.....	do.
161	{ Guaranteed..	14.50		4.00		9.50			
	{ Found.....	14.25	— .25	4.45	.45	7.80	—1.70	do.....	do.
139	{ Guaranteed..	14.00		3.50		11.00			
	{ Found.....	16.25	2.25	5.45	1.95	9.06	—1.94	do.....	do.
83	{ Guaranteed..	14.50		4.00		11.00			
	{ Found.....	14.75	.25	4.21	.21	10.31	— .69	do.....	do.
8	{ Guaranteed..	14.50		4.00		9.50			
	{ Found.....	15.00	.50	4.50	.50	8.32	—1.18	do.....	do.
299	{ Guaranteed..	14.50		4.09		6.30			
	{ Found.....	15.00	.50	3.97	— .13	6.95	.65	do.....	do.
4	{ Guaranteed..								
	{ Found.....	14.38		3.76		7.68		do.....	Wheat bran, wheat berries and screenings.
5	{ Guaranteed..	17.13		4.09		6.30			
	{ Found.....	13.37	—3.76	3.27	— .82	6.17	— .13	Pure wheat products.....	Bran, whole wheat screenings, corn cockle.
7	{ Guaranteed..	15.25		4.42		4.80			
	{ Found.....	13.75	—1.50	3.50	— .92	6.35	1.55	Wheat bran.....	Wheat bran, some chaff and screenings.
46	{ Guaranteed..	17.13		4.09		6.50			
	{ Found.....	13.50	3.63	4.19	.10	6.82	.32	do.....	do.
285	{ Guaranteed..								
	{ Found.....	14.13		4.33		6.41		do.....	Wheat bran.
97	{ Guaranteed..	14.50		4.00		9.50			
	{ Found.....	15.13	.63	4.36	.36	9.40	— .10	do.....	do.
85	{ Guaranteed..	14.50		4.00		11.00			
	{ Found.....	15.00	.50	4.53	.53	9.10	—1.90	do.....	do.
273	{ Guaranteed..	14.50		4.00		10.00			
	{ Found.....	15.38	.88	5.36	1.36	10.15	.15	do.....	do.
91	{ Guaranteed..	14.50		4.00		11.00			
	{ Found.....	15.87	1.37	4.49	.49	8.35	—2.65	do.....	do.
45	{ Guaranteed..	14.50		4.00		11.00			
	{ Found.....	14.75	.25	4.28	.28	9.81	—1.19	do.....	do.
271	{ Guaranteed..								
	{ Found.....	15.88		4.99		5.77		do.....	do.
6555	{ Guaranteed..								
	{ Found.....	13.88		4.28		7.77		do.....	do.
6542	{ Guaranteed..	16.75		4.50		4.71			
	{ Found.....	14.49	—2.26	4.21	— .29	5.57	.86	do.....	

## ANALYSES OF

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price
6554	Bran.....		Sent by R. F. Linville, Kernersville.	Mar. —, '14		
6576	Wheat Bran.....		Sent by North State Milling Co., Greensboro.	May —, '14		
6569	...do.....		Sent by P. M. Phillips, Salisbury.	Apr. —, '14		
6516	...do.....	J. H. Walker & Co., Reidsville, N. C.	Sent by J. H. Walker & Co., Reidsville.	Oct. —, '13		

## RECAPITU

	Guaranteed and Found
Maximum.....	{ Guaranteed..... Found.....
Minimum.....	{ Guaranteed..... Found.....
Average.....	{ Guaranteed..... Found.....
Discrepancy.....	{ Maximum..... Minimum..... Average.....
Number analyzed.....	{ Guaranteed..... Deficient..... Total.....

\*Of the guarantees, not of total analyzed.

Note:—"Deficient" means here below guarantee and,

In discrepancy, the minus sign (—) before a number above guarantee.

## WHEAT BRAN—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
6554	{ Guaranteed.....	-----		-----		-----			
	{ Found.....	12.50		6.12		13.17			
6576	{ Guaranteed.....	-----		-----		-----			
	{ Found.....	16.38		4.50		7.86			
6569	{ Guaranteed.....	-----		-----		-----			
	{ Found.....	14.00		4.15		5.33			
	{ Guaranteed.....	14.50		4.00		9.50			
6516	{ Found.....	13.50	-1.00	4.97	.97	7.85	-1.65		

## LATION

Protein, Per Cent		Fat, Per Cent		Fibre, Per Cent	
17.13		5.35		11.00	
16.38		6.12		10.58	
13.75		3.00		4.71	
12.50		2.66		4.86	
-----		-----		-----	
3.63	-3.76	1.95	-1.34	1.55	-3.42
.06	-.07	.01	-.06	.50	-.05
-----		-----		-----	
49 or 86	per cent.	49 or 86	per cent.	49 or 86	per cent.
21 or 43	per cent.*	11 or 22	per cent.*	39 or 80	per cent.*
57	57	57	57	57	57

in the case of fiber, means also better than guarantee.

means below guarantee; in all other cases the discrepancy is

## ANALYSES OF MIDLINGS,

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price
84	Pure Wheat Middlings.....	Acme-Evans Co., Rich- mond, Va.	J. H. Culbreth & Co., Fayetteville.	Nov. 6, '13	75	\$1.30
86	...do.....	...do.....	Adams Grain & Produce Co., Fayetteville.	Nov. 6, '13	75	1.30
100	...do.....	...do.....	H.W. Little & Co., W'd'sb'ro	Nov. 11, '13	100	1.80
171	Minnesota Fancy White Middlings.	W. S. Ankeny & Co., Minneapolis, Minn.	W. A. Myatt, Raleigh.....	-----	100	-----
146	Standard Middlings.....	Ballard & Ballard, Louis- ville, Ky.	W. S. White & Co., Eliza- beth City.	Jan. 4, '14	100	1.70
141	Wheat Middlings.....	Blank Gottshall, Sunbury, Pa.	Pippin & Woolard, Wash- ington.	Jan. 12, '14	100	-----
164	Tiger Wheat Middlings.....	Davis, Robinson & Co., Roanoke, Va.	C. Call, Wilkesboro.....	Mar. 18, '14	100	1.75
301	Daisy Middlings.....	...do.....	Farmers' Union Agency, Winston-Salem.	June 16, '14	100	1.90
44	Barley Middlings.....	...do.....	A. T. Rothrock, Walnut Cove.	Sept. 8, '13	-----	-----
247	Standard Middlings.....	D. H. Dixon, Goldsboro, N. C.	B. G. Thompson & Son, Goldsboro.	-----	100	1.75
243	Bixota Middlings.....	...do.....	M. J. Best & Sons, Golds- boro.	Apr. 7, '14	100	1.75
196	Pure Wheat Brown Middlings.	The Dunlop Milling Co., Clarksville, Tenn.	F. D. Barkley & Co., Gastonia.	Mar. 28, '14	75	1.50
118	Patapsco Winter Wheat Brown Middlings.	C. A. Gambrell Mfg. Co., Baltimore.	R. D. Caldwell & Sons, Lumberton.	Oct. 23, '13	-----	-----
119	Ben Hur Middlings.....	Hennepin Mill Co., Minne- apolis, Minn.	S. M. Savage, Greenville...	Nov. 21, '13	100	1.75
167	Daisy Middlings.....	Huff & Cook, Roanoke, Va.	A. T. Rothrock, Walnut Cove.	Jan. 20, '14	100	1.60
147	Badger Wheat Middlings.	Chas. A. Krause Milling Co., Milwaukee, Wis.	W. S. White & Co., Eliza- beth City.	Jan. 14, '14	-----	-----
234	Eagle Middlings.....	J. B. A. Kerns & Sons, Milwaukee, Wis.	Surry-Wilkes-Yadkin Sup- ply Co., Elkin.	May 26, '14	100	1.75
264	Big Diamond Wheat Standard Middlings.	Chas. Lunsford & Gray, Petersburg, Va.	Howard Jobbing Co., Weldon.	Apr. 16, '14	100	1.85
22	Rich Middlings.....	Model Milling Co., John- son City, Tenn.	Asheville Grocery Co., Asheville.	July 18, '13	75	-----
125	...do.....	...do.....	Sladen, Fakes & Co., Asheville.	Nov. 24, '13	75	1.35
58	Pure Wheat Middlings.....	Northwestern Consoli- dated Milling Co., Minneapolis, Minn.	Hazel & Mimms, Reids- ville.	Jan. 20, '14	100	1.70
137	Standard Middlings.....	Pillsbury Mills, Minneap- olis, Minn.	C. B. Hill, New Bern.....	Jan. 10, '14	100	1.75
138	Brown Middlings.....	...do.....	C. G. Morris & Co., Wash- ington.	Jan. 12, '14	100	-----
174	Pillsbury XX Daisy Middlings.	...do.....	Sent by the manufacturers.	Feb. —, '14	-----	-----
162	...do.....	...do.....	Leaksville-Spray Grocery Co., Leaksville.	Jan. 20, '14	100	1.80
157	...do.....	...do.....	Hazel & Mimms, Reids- ville.	Jan. 20, '14	100	1.75
77	...do.....	...do.....	The West Hill Co., Mt. Airy.	Oct. 16, '13	100	1.90

## SHORTS AND RED DOG

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
84	{ Guaranteed.....	15.00		4.00		8.00		Pure wheat middlings	As guaranteed.
	{ Found.....	17.63	2.63	5.23	1.23	7.92	-.08		
86	{ Guaranteed.....	15.00		4.00		8.00		do	do.
	{ Found.....	16.50	1.50	5.05	1.05	7.75	-.25		
100	{ Guaranteed.....	15.00		4.00		8.00		do	do.
	{ Found.....	17.00	2.00	5.11	1.11	6.86	-1.14		
171	{ Guaranteed.....	15.00		4.00		7.05		do	do.
	{ Found.....	17.13	2.13	5.10	1.10	5.00	-2.05		
146	{ Guaranteed.....	15.69		4.26		6.87		do	do.
	{ Found.....	14.13	-1.56	4.25	-.01	5.05	-1.22		
141	{ Guaranteed.....	16.00		5.00		4.50		do	do.
	{ Found.....	16.25	.25	5.05	.05	4.60	.10		
164	{ Guaranteed.....							do	do.
	{ Found.....	17.50		5.37		4.75			
301	{ Guaranteed.....	17.00		4.60		4.00		do	do.
	{ Found.....	17.75	.75	4.60	.00	3.26	-.74		
44	{ Guaranteed.....							Said to be barley middlings.	
	{ Found.....	10.63		1.25		1.27			
247	{ Guaranteed.....	15.00		3.50		9.50		Wheat middlings	do.
	{ Found.....	17.88	2.88	5.32	1.82	6.37	-3.13		
243	{ Guaranteed.....	17.00		4.00		8.00		do	do.
	{ Found.....	18.38	1.38	6.00	2.00	6.02	1.98		
196	{ Guaranteed.....	16.25		4.60		6.00		do	do.
	{ Found.....	14.88	-1.57	3.79	-.81	4.12	1.88		
118	{ Guaranteed.....	15.00		4.00		6.00		do	do.
	{ Found.....	15.50	.50	4.41	.41	7.93	1.93		
119	{ Guaranteed.....	15.00		4.00		8.00		do	do.
	{ Found.....	17.12	2.12	5.29	1.25	7.71	-.29		
167	{ Guaranteed.....	16.00		4.50		4.00		do	do.
	{ Found.....	18.00	2.00	4.80	.30	2.27	-1.73		
147	{ Guaranteed.....	12.00		4.50		7.00		Wheat bran.	
	{ Found.....	15.25	3.25	4.39	-.11	7.58	.58		
284	{ Guaranteed.....	16.00		3.00		5.43		do	As guaranteed.
	{ Found.....	15.88	-.12	3.47	.47	5.72	.29		
264	{ Guaranteed.....	14.67		4.21		9.35		do	do.
	{ Found.....	18.13	3.46	5.69	1.48	6.65	-2.70		
22	{ Guaranteed.....	15.02		4.00		7.20		Wheat middlings, shorts and offal.	do.
	{ Found.....	15.81	.79	4.55	.55	6.80	-.40		
125	{ Guaranteed.....	14.02		4.00		7.20		Pure wheat middlings	do.
	{ Found.....	15.87	1.85	4.51	.51	6.11	-1.09		
158	{ Guaranteed.....	15.00		4.50		10.00		Wheat middlings	do.
	{ Found.....	16.38	1.38	5.27	.77	8.07	-1.93		
137	{ Guaranteed.....	15.00		4.50		8.00		do	do.
	{ Found.....	17.00	2.00	5.11	.61	9.01	1.01		
138	{ Guaranteed.....	15.00		4.50		8.00		do	do.
	{ Found.....	16.50	1.50	5.15	.65	8.79	.79		
174	{ Guaranteed.....	17.00		4.50		4.00		do	do.
	{ Found.....	18.50	1.50	4.85	.35	2.65	-1.35		
162	{ Guaranteed.....	17.00		4.50		4.00		do	do.
	{ Found.....	17.50	.50	4.16	-.34	2.47	-1.53		
157	{ Guaranteed.....	16.00		4.50		4.00		do	do.
	{ Found.....	18.38	2.38	5.17	.67	3.70	-.30		
77	{ Guaranteed.....	16.00		4.50		4.00		do	do.
	{ Found.....	18.87	2.87	4.52	.02	2.87	-1.13		

## ANALYSES OF MIDLINGS,

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price
154	Daisy Middlings.....	do.....	Stokes Grocery Co., Walnut Cove.	Jan. 20, '14	100	\$1.65
47	do.....	do.....	Farmers' Union Agency, Winston-Salem.	Sept. 9, '13	100	1.85
69	do.....	do.....	J. M. O'Briant & Bro., Roxboro.	Oct. 8, '13	100	1.90
10	Pure Wheat Middlings....	Stuarts Draft Milling Co., Stuarts Draft, Va.	Cline & Moose, Concord...	July 15, '13	100	----
307	do.....	do.....	W. H. Turner, Winston-Salem.	June 16, '14	100	2.00
235	Middlings Made in Argentine.	Chas. Schaefer & Son, Wilmington, N. C.	Chas. Schaefer & Son, Wilmington.	-----	100	1.75
236	do.....	do.....	R. D. Caldwell & Son, Lumberton.	Apr. 3, '14	100	1.75
237	do.....	do.....	John P. McNeill, Lumberton.	Apr. 3, '14	100	1.65
61	Standard Middlings.....	Washburn-Crosby Co., Minneapolis, Minn.	Cline & Moose, Concord...	Sept. 26, '13	100	1.75
57	do.....	do.....	The Patterson Co., Greensboro.	Sept. 22, '13	100	1.65
297	do.....	do.....	T. M. Benton, Winston-Salem.	June 16, '14	100	1.60
88	do.....	Washburn-Crosby Co., Louisville, Ky.	Adams Grain & Provision Co., Fayetteville.	Nov. 6, '13	100	----
262	Pure Wheat Middlings....	do.....	Eugene Johnson, Littleton	Apr. 16, '14	100	1.65
258	Wheat Middlings.....	do.....	Littleton Feed & Grocery Co., Littleton.	Apr. 16, '14	100	1.85
283	XX Daisy Middlings .....	do.....	S. W. Y. Supply Co., Elkin.	May 26, '14	100	1.85
276	do.....	do.....	The West-Hill Co., Mt. Airy.	May 13, '14	100	1.90
272	do.....	do.....	G. C. Lovell Co., Mt. Airy.	May 13, '14	100	1.90
269	do.....	do.....	Parham Supply Co., Henderson.	Apr. 17, '14	100	1.85
267	do.....	do.....	Geo. A. Rose Co., Henderson.	Apr. 17, '14	100	1.85
303	Standard Wheat Middlings.	Washburn-Crosby Co., Minneapolis, Minn.	Winston Grain Co., Winston-Salem.	June 16, '14	100	1.70
254	Wheat Middlings and Ground Screenings.	do.....	Southern Feed & Grocery Co., Durham.	Apr. 15, '14	100	1.70
176	do.....	do.....	Sent by the manufacturers	Feb. —, '14	-----	-----
177	do.....	do.....	do.....	Feb. —, '14	-----	-----
90	Middlings and Cleanings.	B. A. Eckhart Milling Co., Chicago, Ill.	The D. L. Gore Co., Wilmington.	Nov. 8, '13	100	1.65
166	Eagle Rye Middlings.....	Huff & Cook, Roanoke, Va.	A. T. Rothrock, Walnut Cove.	Jan. 20, '14	100	1.60
6556	Wheat Middlings.....	J. D. Anderson, Tobacco-ville, N. C.	Sent by the owner.....	Mar. —, '14	-----	-----
6531	do.....	Wilkins-Ricks Co., Sanford, N. C.	do.....	Oct. —, '13	-----	-----

## SHORTS AND RED DOG—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
154	{ Guaranteed.....	16.00		4.50		4.00			
	{ Found.....	17.38	1.38	4.67	.17	2.81	-1.19	Wheat middlings.....	As guaranteed.
47	{ Guaranteed.....	16.00		4.50		4.00			
	{ Found.....	17.75	1.75	4.31	.19	3.52	-.48	do.....	do.
69	{ Guaranteed.....	16.00		4.50		4.00			
	{ Found.....	17.00	1.00	2.35	-2.15	2.88	-4.12	do.....	do.
10	{ Guaranteed.....	16.00		5.00		5.00			
	{ Found.....	13.88	-2.12	2.85	-2.15	1.58	-3.42	do.....	do.
307	{ Guaranteed.....	15.00		4.00		4.00			
	{ Found.....	15.50	.50	3.78	-.22	2.73	-1.27	do.....	do.
235	{ Guaranteed.....	15.31		3.83		6.68		Wheat middlings and	
	{ Found.....	18.50	3.19	4.32	.59	7.80	1.12	ground screenings.....	do.
236	{ Guaranteed.....	15.31		3.83		6.68			
	{ Found.....	18.50	3.19	4.43	.60	5.27	-1.41	do.....	do.
237	{ Guaranteed.....	15.31		3.83		6.68			
	{ Found.....	18.38	3.08	4.48	.65	5.41	-1.27	do.....	do.
61	{ Guaranteed.....	15.00		4.00		8.00			
	{ Found.....	17.87	2.87	5.35	1.35	6.62	-1.38	do.....	do.
57	{ Guaranteed.....	15.00		4.00		8.00			
	{ Found.....	17.87	2.87	5.22	1.22	6.12	-1.88	do.....	do.
297	{ Guaranteed.....	15.00		5.00		9.00			
	{ Found.....	16.88	1.88	5.60	.60	6.57	-2.43	do.....	do.
88	{ Guaranteed.....	15.00		4.00		8.00			
	{ Found.....	16.88	1.88	4.86	.86	7.47	-.53	do.....	do.
262	{ Guaranteed.....	17.02		4.03		9.04			
	{ Found.....	17.00	-.02	5.45	1.42	7.72	-1.32	do.....	do.
258	{ Guaranteed.....	15.00		4.50		10.00			
	{ Found.....	15.63	.63	5.10	.60	8.46	-1.54	Wheat middlings.....	do.
283	{ Guaranteed.....	16.00		4.00		4.00			
	{ Found.....	16.00	.00	3.22	-.78	3.23	-.77	do.....	do.
276	{ Guaranteed.....	17.00		4.50		4.00			
	{ Found.....	17.75	.75	4.72	.22	3.52	-.48	do.....	do.
272	{ Guaranteed.....	17.00		4.50		4.00			
	{ Found.....	17.25	.25	4.81	.31	3.56	-.44	do.....	do.
269	{ Guaranteed.....	16.00		4.50		4.00			
	{ Found.....	18.13	2.13	4.26	-.24	3.09	-.91	do.....	do.
267	{ Guaranteed.....	16.00		4.50		5.00			
	{ Found.....	18.50	2.50	4.72	.22	2.79	-2.21	do.....	do.
303	{ Guaranteed.....	15.00		5.00		9.50			
	{ Found.....	16.75	1.75	5.45	.45	7.15	-2.35	Middlings and screenings	do.
254	{ Guaranteed.....	15.00		5.00		9.50			
	{ Found.....	17.38	2.38	5.43	.43	6.65	-2.85	do.....	do.
176	{ Guaranteed.....	15.00		4.50		7.00			
	{ Found.....	17.94	2.94	4.02	.42	4.44	-2.56	do.....	do.
177	{ Guaranteed.....	15.00		4.50		10.00			
	{ Found.....	16.63	1.63	5.22	.72	9.02	-.98	do.....	do.
90	{ Guaranteed.....	14.00		4.00		11.00			
	{ Found.....	16.50	2.50	4.41	.41	6.00	-5.00	do.....	do.
166	{ Guaranteed.....	15.00		3.00		5.70			
	{ Found.....	16.00	1.00	3.49	.49	5.41	-.29	do.....	do.
6556	{ Guaranteed.....	-----		-----		-----			
	{ Found.....	13.00		3.43		2.43		Wheat middlings.....	do.
6531	{ Guaranteed.....	-----		-----		-----			
	{ Found.....	16.87		5.85		5.67		do.....	do.

## ANALYSES OF MIDLINGS,

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price
6508	Walter's [S] Middlings	J. A. Walter Milling Co., Buffalo, N. Y.	Sent by the manufacturer	Aug. —, '13	—	\$—
6501	Standard Middlings	Crescent Milling Co., Fairfax, Minn.	H. Weil & Bro., Goldsboro	July 10, '13	—	—
6501	Standard Middlings	Hubbard Milling Co., Mankato, Minn.	do	July 10, '13	—	—
156	Pure Wheat Shorts	Andrew Bowling, Staunton, Va.	Hazel & Mimms, Reidsville.	Jan. 20, '14	100	1.70
13	do	Liberty Mills, Nashville, Tenn.	City Feed Co., Hickory	Sept. 18, '13	100	1.75
184	do	Middle Tennessee Milling Co., Tullahoma, Tenn.	C. Call, Wilkesboro	Mar. 18, '14	100	1.80
9	Pure Wheat Shorts	South Side Roller Mills, Winston-Salem, N. C.	Angelo Bro., Winston	July 10, '13	—	—
6520	do	White Star Mills, Staunton, Va.	J. C. Thomas & Co., Apex.	Oct. 6, '13	—	—
300	Red Dog Middlings	Austin-Heaton Co., Durham, N. C.	S. J. Adams, Raleigh	July 10, '14	100	1.85
6587	do	do	Sent by manufacturer	July 10, '14	—	—
6588	do	do	do	" " "	—	—
12	Red Dog G. Flour	Bay State Milling Co., Winona, Minn.	Overman & Co., Salisbury	Sept. 16, '13	100	1.95
57	Red Dog Middlings	do	Elmore Maxwell Co., Greensboro.	Sept. 9, '13	100	1.95
263	Superb Red Dog Middlings	Eagle Roller Mill Co., New Ulm, Minn.	M. C. Braswell, Battleboro.	Apr. 16, '14	100	1.80
72	Eagle Red Dog Middlings	Lynchburg Milling Co., Lynchburg, Va.	B. W. Murphy Co., Roxboro.	Oct. 8, '13	100	1.90
215	Red Dog Middlings	Washburn-Crosby Co., Minneapolis, Minn.	Elmore Maxwell Co., Greensboro.	Mar. 31, '14	100	2.00

## RECAPIT

	Guaranteed and Found
Maximum	{ Guaranteed Found
Minimum	{ Guaranteed Found
Average	{ Guaranteed Found
Discrepancy	{ Maximum Minimum Average
Number analyzed	{ Guaranteed Deficient Total

\*Of the guaranteed, not of the total.

Note: "Deficient" here means below guarantee, and, See also Note on pages 24 and 28.

## SHORTS AND RED DOG—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
6508	{ Guaranteed.....	16.88		5.86		7.62		Wheat middlings.....	As guaranteed.
	{ Found.....	16.72		5.38					
6501	{ Guaranteed.....	19.13	2.41	6.79	1.41	7.59		do.....	do.
	{ Found.....	14.50		5.10		10.00			
6500	{ Guaranteed.....	18.25	3.75	6.83	1.73	6.63	-3.32	do.....	do.
	{ Found.....	14.50		4.00		6.00			
156	{ Guaranteed.....	18.13	3.63	5.60	1.60	5.82	-.18	Wheat shorts.....	do.
	{ Found.....	16.00		4.00		6.00			Shorts, bran and screenings.
13	{ Guaranteed.....	15.88	-.12	4.92	.92	4.78	-1.22	do.....	
	{ Found.....	16.00		6.00		4.00			
184	{ Guaranteed.....	15.75	-.25	4.73	-1.27	3.46	-.54	do.....	As guaranteed.
	{ Found.....	10.00		4.00		4.00			
9	{ Guaranteed.....	15.00	5.00	4.60	.60	3.85	-.15	do.....	As claimed.
	{ Found.....	14.50		4.00		8.00			
6520	{ Guaranteed.....	15.25	.70	4.04	.04	6.45	-1.55	do.....	Shorts and crushed wheat
	{ Found.....	17.50		4.50		2.50			
300	{ Guaranteed.....	15.63	-1.87	3.39	-1.11	2.00	-.50		
	{ Found.....								
6537	{ Guaranteed.....								
	{ Found.....	14.38		3.26		2.16			
6538	{ Guaranteed.....								
	{ Found.....	15.12		3.15		1.93			
12	{ Guaranteed.....	18.00		4.00		2.50			
	{ Found.....	16.38	-1.62	4.16	.16	1.23	-1.27	Red dog.....	As claimed.
	{ Found.....	18.00		4.50		6.00			
51	{ Guaranteed.....	16.50	-1.50	4.13	-.37	1.20	-4.80	do.....	do.
	{ Found.....	19.02		5.33		4.38			
263	{ Guaranteed.....	19.50	.48	5.58	.25	3.90	-.48	do.....	do.
	{ Found.....	19.00		5.00		2.13			
72	{ Guaranteed.....	16.87	-2.13	3.35	-1.65	1.78	-.35	do.....	do.
	{ Found.....	16.00		4.50		7.00			
215	{ Guaranteed.....	17.75	1.75	4.65	.15	1.39	-5.61	do.....	do.
	{ Found.....								

## ULATION

Protein, Per Cent	Fat, Per Cent	Fibre, Per Cent
19.00	6.00	11.00
19.50	6.83	9.02
10.00	3.00	2.13
13.00	2.35	1.20
5.00 —2.12	2.00 —2.15	1.98 —5.61
.25 —.02	.02 —.01	.10 —.03
63 or 90 per cent.	63 or 90 per cent.	63 or 90 per cent.
11 or 17 per cent.*	13 or 20.5 per cent.*	53 or 84 per cent.*
70	70	70

in the case of fiber. means also better than guarantee.

## ANALYSES OF MIXTURES OF BRAN, SHORTS

Laboratory Number	Brand Name form Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.		Price
18	Bran and Shorts.....	.....	City Feed Co., Hickory....	Sept. 18, '13	100	\$1.75	
15	Wheat Bran and Middlings.	Concord Milling Co., Concord, N. C.	H. L. Parks & Co., Concord.	July 15, '13	100	-----	
68	Pure Bran and Shorts ....	Glen Anna Milling Co., Thomasville, N. C.	Denton Mer. Co., Denton.	Sept. 24, '13	-----	-----	
14	Choice Wheat Bran and Shorts.	Grimes Milling Co., Salisbury, N. C.	Salisbury Grain & Feed Store, Salisbury.	July 12, '13	75	-----	
201	Pure Wheat Bran and Shorts.	Hickory Milling Co., Hickory, N. C.	Gaston Seed & Produce Co., Gastonia.	Mar. 26, '14	75	1.40	
17	Bran and Shorts Mixed....	Newport Mills, Newport, Tenn.	City Feed Co., Hickory....	Sept. 18, '13	75	1.30	
16	do.....	do.....	Widenhouse & Co., Kannapolis.	Sept. 16, '13	75	1.40	
6536	do.....	Newsom Roller Mills, Newsom, N. C.	.....	Dec. —, '13	-----	-----	
6514	Wheat Bran and Shorts....	Kings Mountain Roller Mills, Kings Mtn., N. C.	W. A. Ware & Co., Kings Mountain.	Aug. —, '13	-----	-----	
6511	do.....	Statesville Flour Mill Co., Statesville, N. C.	Statesville Flour Mill Co.	Sept. —, '13	-----	-----	
6533	Wheat Bran and Wheat Middlings.	Farmers' Cooperative Milling Co., Valdese, N. C.	.....	Nov. —, '13	-----	-----	
92	Wheat Bran and Screenings.	Dunlop Milling Co., Clarksville, Tenn.	B. F. Mitchell, Wilmington.	Nov. 8, '13	100	1.60	
33	Wheat Bran, Shorts and Screenings.	Landis Milling Co., Landis, N. C.	Graham & Thomason, Kannapolis.	Sept. 16, '13	75	1.40	
23	Pure Wheat Bran and Screenings.	Liberty Mills, Nashville, Tenn.	Adams Grain & Produce Co., Asheville.	July 18, '13	100	-----	
175	Wheat Bran and Screenings.	Pillsbury Flour Mills Co., Minneapolis, Minn.	Sent by the manufacturers	Feb. —, '14	-----	-----	
6524	Bran and Shorts.....	Star Milling Co., Statesville, N. C.	do.....	Oct. —, '13	-----	-----	
6563	Wheat Standard B Middlings and Screenings.	.....	Sent by J. A. Lawson, Danbury, R. F. D. 1.	Apr. —, '14	-----	-----	

## RECAPIT

	Guaranteed and Found
Maximum.....	{ Guaranteed..... Found.....
Minimum.....	{ Guaranteed..... Found.....
Average.....	{ Guaranteed..... Found.....
Discrepancy.....	{ Maximum..... Minimum..... Average.....
Number analyzed.....	{ Guaranteed..... Deficient..... Total.....

\*Of the guaranteed.

Note: "Deficient" here means below guarantee and.  
See also Note on pages 24 and 28.

## OR MIDLINGS AND SCREENINGS

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
18	{ Guaranteed	14.50		4.00		7.00			
	{ Found.....	16.80	2.30	4.80	.80	6.13	— .87	Bran, middlings, screenings.	As guaranteed.
15	{ Guaranteed	17.50		4.63		7.36			
	{ Found.....	14.38	—3.12	4.68	.05	6.61	— .75	Bran middlings.....	do.
68	{ Guaranteed	16.25		5.01		7.90			
	{ Found.....	14.37	—1.88	4.72	— .29	6.62	—1.28	Bran shorts.....	do.
14	{ Guaranteed	15.12		4.00		7.00			
	{ Found.....	13.50	—1.62	3.53	— .47	4.83	—2.17	do.....	do.
201	{ Guaranteed	15.00		4.00		6.00			
	{ Found.....	13.88	—1.12	3.50	— .50	4.43	—1.57	do.....	do.
17	{ Guaranteed	14.50		4.00		8.00			
	{ Found.....	16.38	1.88	4.90	.90	5.86	—2.14	Bran, shorts, screenings	do.
16	{ Guaranteed	14.50		4.00		8.00			
	{ Found.....	14.50	.00	3.94	— .06	4.86	—3.14	do.....	do.
6536	{ Guaranteed								
	{ Found.....	15.12		4.23		6.08		do.....	do.
6514	{ Guaranteed								
	{ Found.....	14.25		4.65		5.21		do.....	do.
6511	{ Guaranteed	16.00		4.00		7.00			
	{ Found.....	16.00	.06	4.86	.86	6.26	— .74		
6533	{ Guaranteed								
	{ Found.....	14.50		4.14		5.47			
92	{ Guaranteed	14.75		4.00		9.50		Wheat bran and screenings.	do.
	{ Found.....	13.37	—1.38	4.35	.35	7.63	—1.87		
33	{ Guaranteed	14.99		5.02		6.38		Wheat bran, shorts and screenings.....	do.
	{ Found.....	15.25	.26	4.26	— .76	4.98	—1.40		
23	{ Guaranteed	14.50		4.00		9.50			
	{ Found.....	13.38	—1.12	4.64	.64	9.05	— .45	Wheat bran and screenings	do.
175	{ Guaranteed	14.50		4.00		12.00			
	{ Found.....	16.25	1.75	4.67	.67	9.08	—2.92		
6524	{ Guaranteed								
	{ Found.....	13.50		3.80		5.96			
6563	{ Guaranteed								
	{ Found.....	16.05		5.32		9.08		Wheat middlings and screenings.	

## ULATION

Protein, Per Cent	Fat, Per Cent	Fibre, Per Cent
17.50	5.02	12.00
16.38	5.32	9.08
14.50	4.00	6.00
13.37	3.50	4.43
-----	-----	-----
2.30 —3.12	.90 — .76	----- —3.14
.06 —1.12	.05 — .06	----- — .45
-----	-----	-----
11 or 65 per cent.	11 or 65 per cent.*	11 or 65 per cent.
6 or 55 per cent.*	5 or 45 per cent.	11 or 100 per cent.*
17	17	17

in the case of fiber, means also better than guarantee.

## ANALYSES OF TRADE-NAME MIXTURES OF

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price
96	Thoroughbred Feed.....	Lexington Roller Mill Co., Lexington, Ky.	A. W. Porter Co., Inc., Rockingham.	Nov. 11, '13	100	\$1.65
34	Hog Feed.....	Statesville Flour Mill Co., Statesville, N. C.	Graham & Thomason, Kannapolis.	Sept. 16, '13	100	1.80
66	do.....	do.....	W. J. Fite, Charlotte.....	Sept. 25, '13	75	1.35
87	do.....	do.....	Adams Grain & Provision Co., Fayetteville.	Nov. 6, '13	75	-----
190	do.....	do.....	Harris & McNeely, Moores- ville.	Mar. 25, '14	100	1.85
203	do.....	do.....	F. D. Brakley & Co., Gastonia.	Mar. 26, '14	75	1.50
266	do.....	do.....	Geo. A. Rose & Co., Hen- derson.	Apr. 17, '14	100	1.80
278	do.....	do.....	Blair & Co., North Wilkes- boro.	May 25, '14	100	1.75
293	do.....	do.....	Rhyme Bros., Charlotte...	June 11, '14	75	1.40
63	Bulls Eye Mixed Feed.....	Blish Milling Co., Sey- more, Ind.	Adams Grain & Provision Co., Charlotte.	Sept. 25, '14	75	1.35
309	Gwinn's Daisy Feed Bran and Shorts.	Gwinn Milling Co., Colum- bus, O.	W. A. Turner, Winston- Salem.	June 16, '14	100	1.85
188	Satisfaction Mill Feed.....	Mooresville Flour Mill Co., Mooresville, N. C.	R. W. Freeze & Sons, Mooresville.	Mar. 25, '14	100	1.75
186	do.....	do.....	Howard Brawley Co., Mooresville.	Mar. 25, '14	100	1.85
178	Fancy Wheat Mixed Feed	Pillsbury Flour Mill Co., Minneapolis, Minn.	Sent by the Manufacturer..	Feb. —, '14	-----	-----
60	Pure Wheat Bran and Shipstuff.	Banner Roller Mills, Lin- colnton, N. C.	Adams Grain & Produce Co., Charlotte.	Sept. 25, '13	100	1.80

## RECAPIT

	Guaranteed and Found
Maximum.....	{ Guaranteed..... Found.....
Minimum.....	{ Guaranteed..... Found.....
Average.....	-----
Discrepancy.....	{ Maximum..... Minimum..... Average.....
Number analyzed.....	{ Guaranteed..... Deficient..... Total.....

\*Per cent of the guaranteed, not of the total.

Note: "Deficient" means here below guarantee, and  
See also Note on pages 24 and 28.

## WHEAT BRAN, MIDDINGS AND SCREENINGS

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
96	{ Guaranteed	15.75		3.83		7.09			
	{ Found.....	15.38	— .37	4.30	.47	5.97	—1.12		Wheat bran and middlings.
34	{ Guaranteed	15.00		4.00		7.00			do.
	{ Found.....	15.00	.00	3.66	— .34	4.52	—2.48		
66	{ Guaranteed	15.00		4.00		7.00			do.
	{ Found.....	14.37	— .63	3.78	— .22	5.42	—1.58		
87	{ Guaranteed	15.00		4.00		7.00			do.
	{ Found.....	15.63	.63	3.97	— .03	5.04	—1.96		
190	{ Guaranteed	15.00		4.00		7.00		Wheat bran, middlings and screenings	As guaranteed.
	{ Found.....	15.00	.00	4.45	.45	5.60	—1.40		
202	{ Guaranteed	15.00		4.00		7.00			do.
	{ Found.....	15.63	.63	4.25	.25	5.08	—1.92	do.	
266	{ Guaranteed	15.00		4.00		7.00			do.
	{ Found.....	14.88	— .12	4.15	.15	5.58	—1.42	do.	
278	{ Guaranteed	15.40		4.00		7.00			do.
	{ Found.....	15.00	— .40	4.37	.37	5.78	—1.22	do.	
293	{ Guaranteed	15.00		4.00		7.00			do.
	{ Found.....	14.50	— .50	4.05	.05	4.92	—2.08	do.	
63	{ Guaranteed	16.00		4.40		9.10			do.
	{ Found.....	14.62	—1.38	4.20	— .20	5.27	—3.83	Pure wheat product.	
309	{ Guaranteed	16.00		4.00		7.00		Bran and middlings.	
	{ Found.....	16.00	.00	5.42	1.42	6.26	— .74		Bran shorts.
188	{ Guaranteed	14.00		4.00		8.00			do.
	{ Found.....	14.13	.13	3.27	— .73	3.82	—4.18		
186	{ Guaranteed	14.00		4.00		8.00			do.
	{ Found.....	13.63	— .37	3.98	— .02	4.42	—3.58		
178	{ Guaranteed	16.00		4.50		9.00			do.
	{ Found.....	17.00	1.00	4.64	.14	6.37	—2.63	Wheat bran, flour, screenings	As guaranteed.
60	{ Guaranteed	14.50		4.00		8.00			
	{ Found.....	14.87	.37	4.30	.30	7.08	— .92	Wheat bran and shipstuff	do.

## ULATION

Protein, Per Cent	Fat, Per Cent	Fibre, Per Cent
16.00	4.50	9.10
17.00	5.42	7.08
14.00	3.83	7.00
13.63	3.27	3.82
-----	-----	-----
1.00 —1.38	1.42 — .73	.00 —4.18
.13 — .12	.05 — .02	.00 — .74
-----	-----	-----
15 or 100 per cent.	15 or 100 per cent.	15 or 100 per cent.
7 or 46.6 per cent.*	6 or 40 per cent.*	15 or 100 per cent.*
15	15	15

in the case of fiber, means also better than guarantee.

## ANALYSES OF

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price
21	Shipstuff.....	Austin-Heaton Co., Durham, N. C.	Bridgers Grocery Co., Charlotte.	Aug. 15, '13	75	\$....
260	...do.....	do.....	Eugene Johnston, Littleton.	Apr. 16, '14	100	1.80
19	Pure Wheat Shipstuff.....	Dan Valley Mills, Danville, Va.	Farmers' Union Agency, Winston-Salem.	July 10, '13	100	....
49	...do.....	do.....	Elmore Maxwell Co., Greensboro.	Sept. 9, '13	100	1.80
54	...do.....	do.....	Winston Grain Co., Winston-Salem.	Sept. 9, '13	100	1.80
216	Dan Valley Shipstuff.....	do.....	Elmore Maxwell Co., Greensboro.	Mar. 31, '14	100	2.00
225	Pure Wheat Shipstuff.....	do.....	The Patterson Co., Greensboro.	Mar. 30, '14	100	1.80
229	Dan Valley Shipstuff.....	do.....	Wide-Awake Hay and Grocery Co., Greensboro.	Mar. 30, '14	100	1.80
270	Shipstuff.....	do.....	Parham Supply Co., Henderson.	Apr. 17, '14	100	1.80
281	Pure Wheat Shipstuff.....	do.....	F. D. Forrester, North Wilkesboro.	May 25, '14	100	1.75
287	...do.....	do.....	Elkin Mercantile Co., Elkin.	May 26, '14	100	1.80
82	Shipstuff.....	The Dunlop Mills, Richmond, Va.	A. E. Rankin Co., Fayetteville.	Nov. 6, '13	100	1.75
99	...do.....	do.....	Parsons & Hardison, Wadesboro.	Nov. 11, '13	100	1.80
98	...do.....	Harrisonburg Milling Co., Harrisonburg, Va.	F. W. Maurice, Rockingham.	Nov. 11, '14	100	1.80
231	...do.....	do.....	Wide-Awake Hay & Grain Co., Greensboro.	Mar. 30, '14	100	1.70
192	...do.....	Horn-Johnston Co., Mocksville, N. C.	R. W. Freeze & Son, Mooresville.	Mar. 25, '14	100	1.75
189	...do.....	Mt. Ulla Roller Mill Co., Mt. Ulla, N. C.	W. M. Neel & Co., Mooresville.	Mar. 25, '14	100	1.75
199	...do.....	do.....	Harris & McNeely, Mooresville.	Mar. 25, '14	100	1.75
282	Piedmont Shipstuff.....	Piedmont Mills, Lynchburg, Va.	Parsons Bros., North Wilkesboro.	Mar. 25, '14	100	1.75
183	...do.....	do.....	F. D. Forrester & Co., North Wilkesboro.	Mar. 18, '14	100	1.75
185	Piedmont Shipstuff.....	Piedmont Mills, Lynchburg, Va.	North Wilkesboro Feed Store, North Wilkesboro.	Mar. 18, '14	100	1.75
193	...do.....	do.....	W. M. Neel & Co., Mooresville.	Mar. 25, '14	100	1.75
253	...do.....	do.....	Southern Feed & Grocery Co., Durham.	Apr. 15, '14	100	1.75
20	Shipstuff.....	South Side Roller Mills, Winston-Salem, N. C.	Angelo Bro., Winston-Salem.	July 10, '13	....	....
62	...do.....	Statesville Flour Mill Co., Statesville, N. C.	Cline & Moose, Concord...	Sept. 26, '13	100	1.85
191	...do.....	Star Milling Co., Statesville, N. C.	R. W. Freeze & Sons, Mooresville.	Mar. 25, '14	100	1.75
6547	...do.....	R. F. Check, Burlington, N. C.	Sent by the manufacturer.	Feb. —, '14	....	....

## SHIPSTUFF

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
21	{ Guaranteed.....	16.00		4.50		5.50		/	
	{ Found.....	15.25	— .75	4.53	.03	5.71	.21	Shipstuff.....	As guaranteed.
260	{ Guaranteed.....	16.00		4.50		5.50			
	{ Found.....	15.25	— .75	4.57	.07	6.78	1.28	do.....	do.
19	{ Guaranteed.....	16.00		5.00		6.00			
	{ Found.....	15.38	— .62	4.63	— .37	5.58	— .42	do.....	do.
49	{ Guaranteed.....	16.00		5.00		6.00			
	{ Found.....	16.28	.28	4.61	— .39	5.74	— .26	do.....	do.
54	{ Guaranteed.....	16.00		5.00		6.00			
	{ Found.....	16.37	.37	4.69	— .31	5.11	— .89	do.....	do.
216	{ Guaranteed.....	16.00		4.00		5.00			
	{ Found.....	16.50	.50	4.65	.65	5.36	.36	do.....	do.
225	{ Guaranteed.....	16.00		5.00		6.00			
	{ Found.....	16.13	.13	4.70	— .30	5.54	— .46	do.....	do.
229	{ Guaranteed.....	16.00		5.00		6.00			
	{ Found.....	16.88	.88	4.76	— .24	5.66	.34	do.....	do.
270	{ Guaranteed.....	15.00		4.00		5.00			
	{ Found.....	16.25	1.25	4.74	.74	5.04	.04	do.....	do.
281	{ Guaranteed.....	15.00		4.00		5.00			
	{ Found.....	15.75	.75	4.61	.61	5.30	.30	do.....	do.
287	{ Guaranteed.....	15.00		4.00		6.00			
	{ Found.....	16.38	1.38	4.78	.78	5.38	— .62	do.....	do.
82	{ Guaranteed.....	14.50		4.00		7.00			
	{ Found.....	15.38	.88	4.31	.31	5.38	— 1.62	do.....	do.
99	{ Guaranteed.....	14.50		4.00		7.00			
	{ Found.....	15.50	1.00	3.97	— .03	5.43	— 1.57	do.....	do.
98	{ Guaranteed.....	15.00		4.50		7.00			
	{ Found.....	17.25	2.25	5.17	.67	5.39	— 1.61	do.....	do.
231	{ Guaranteed.....	15.00		4.00		6.00			
	{ Found.....	17.38	2.38	5.35	1.35	5.45	— .55	do.....	do.
192	{ Guaranteed.....	15.00		5.00		4.25			
	{ Found.....	14.50	— .50	3.88	— 1.12	6.32	2.07	do.....	do.
189	{ Guaranteed.....	14.00		4.25		5.00			
	{ Found.....	15.00	1.00	3.55	— .70	4.35	— .65	do.....	do.
199	{ Guaranteed.....	14.00		4.25		5.00			
	{ Found.....	14.75	.75	3.82	— .43	4.14	— .86	do.....	do.
282	{ Guaranteed.....	15.00		4.00		6.00			
	{ Found.....	15.13	.13	4.24	.24	5.00	— 1.00	do.....	do.
183	{ Guaranteed.....	15.00		4.00		6.00			
	{ Found.....	16.38	1.38	4.74	.74	4.82	— 1.18	do.....	do.
185	{ Guaranteed.....	15.00		4.00		6.00			
	{ Found.....	15.50	.50	4.64	.64	5.51	— .49	do.....	do.
193	{ Guaranteed.....	15.00		4.00		6.00			
	{ Found.....	15.63	.63	4.52	.52	5.86	— .14	do.....	do.
253	{ Guaranteed.....	15.00		4.00		6.00			
	{ Found.....	15.75	.75	4.60	.60	4.81	— 1.19	do.....	do.
20	{ Guaranteed.....	14.13		3.69		2.57			
	{ Found.....	15.88	1.75	4.82	1.13	5.45	2.88	do.....	do.
62	{ Guaranteed.....	15.00		4.00		7.00			
	{ Found.....	14.62	— .38	3.65	— .35	5.45	— 1.55	do.....	do.
191	{ Guaranteed.....	14.62		4.36		5.00			
	{ Found.....	16.38	1.76	5.90	1.54	4.82	— .18	do.....	do.
6547	{ Guaranteed.....								
	{ Found.....	16.37		4.56		6.01		do.....	do.

## ANALYSES OF

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price
6549	Roaring River Shipstuff.....	C. H. & W. C. Greenwood, Roaring River, N. C.	Sent by the manufacturer.	Feb. —, '14	-----	-----
6568	Shipstuff.....	Adams Grain & Provision Co., Richmond, Va.	Sent by P. M. Phillips, Salisbury.	Apr. —, '14	-----	-----
6510	do.....	Statesville Flour Mill Co., Statesville, N. C.	Sent by the manufacturer.	Aug. —, '13	-----	-----
6520	do.....	Star Milling Co., Statesville, N. C.	do.....	Oct. —, '13	-----	-----
6515	do.....	J. H. Walker & Co., Reidsville.	-----	Aug. —, '13	-----	-----

## RECAPIT

	Guaranteed and Found
Maximum.....	{ Guaranteed..... Found.....
Minimum.....	{ Guaranteed..... Found.....
Average.....	{ Guaranteed..... Found.....
Discrepancy.....	{ Maximum..... Minimum..... Average.....
Number analyzed.....	{ Guaranteed..... Deficient..... Total.....

\*Of the guaranteed, not of the total.

Note: "Deficient" means here below guarantee and.  
See also Note on pages 24 and 28.

## SHIPSTUFF—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
6549	Guaranteed.....								
	Found.....	14.12		3.72		5.46		Shipstuff.....	As guaranteed
6568	Guaranteed.....								
	Found.....	17.00		5.47		7.13		do.....	do.
	Guaranteed.....	15.00		4.00		7.00			
6510	Found.....	15.25	.25	4.32	.32	6.02	-.98	do.....	do.
	Guaranteed.....								
6520	Found.....	14.62		4.36		5.57		do.....	do.
	Guaranteed.....	15.00		4.50		4.50			
6515	Found.....	14.75	-.25	4.33	-.17	4.94	.44		

## ULATION

Protein, Per Cent	Fat, Per Cent	Fibre, Per Cent
16.00	5.00	7.00
17.38	5.90	7.13
14.00	4.00	2.57
14.12	3.55	4.14
-----	-----	-----
1.76    — .75	1.54    —1.12	2.88    —1.62
.13    — .25	.03    — .03	.04    — .14
-----	-----	-----
26 or 86.6 per cent.	26 or 86.6 per cent.	26 or 86.6 per cent.
6 or 23    per cent.*	11 or 42    per cent.*	19 or 73    per cent.*
30	30	30

in the case of fiber, means also better than guarantee.

## ANALYSES OF MIXED FEEDS

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package—Lbs.	Price
37	Boss Feed.....	Asheville Milling Co., Asheville, N. C.	City Feed Co., Hickory	Sept. 18, '13	75	\$1.30
227	White Feed.....	do.....	Wide-Awake Hay & Grain Co., Greensboro.	Mar. 30, '14	100	1.75
212	Mixed Feed.....	Bluefield Milling Co., Bluefield, W. Va.	Thomas & Howard Co., Greensboro.	Mar. 30, '14	100	1.85
105	Daisy Dairy Feed.....	Cairo Milling Co., Cairo, Ill.	M. J. Best & Son, Goldsboro.	Nov. 11, '13	100	1.75
122	Caronoco Feed.....	Carolina Rice Mills, Goldsboro, N. C.	S. M. Savage, Greenville...	Nov. 13, '13	100	1.75
265	Colonial Hog Feed.....	Colonial Cereal Co., Norfolk, Va.	Howard Jobbing Co., Weldon.	Apr. 16, '14	100	1.90
112	Corno.....	The Corno Mills Co., St. Louis, Mo.	T. P. Asheford, New Bern.	Nov. 12, '13	100	1.90
208	Corno Horse and Mule Feed.	do.....	The Patterson Co., Greensboro.	Mar. 30, '14	100	1.85
256	do.....	do.....	Southern Feed and Grocery Co., Durham.	Apr. 15, '14	100	1.90
286	do.....	do.....	The Atkinson Co., Elkin	May 26, '14	100	-----
73	Wheat and Corn Chops...	Davis Robinson Co., Roanoke, Va.	S. V. Thomlinson, North Wilkesboro.	Oct. 16, '13	100	1.85
89	Mixed Feed.....	Douthat, Riddle Co., Danville, Va.	The Armfield Co., Fayetteville.	Nov. 6, '13	75	-----
168	Ceralfa Stock Feed.....	Edgar-Morgan, Memphis, Tenn.	W. A. Myatt, Raleigh	-----	-----	-----
153	Eagle Barley Feed.....	Huff & Cook, Roanoke, Va.	Stokes Grocery Co., Walnut Cove.	Jan. 20, '14	100	1.70
36	International Jewel Feed.	International Sugar Factory No. 2 Co., Memphis, Tenn.	Overman & Co., Salisbury	Sept. 16, '13	100	1.90
203	International Dry Horse and Mule Feed.	do.....	Thomas & Howard Co. Greensboro.	Mar. 30, '14	100	1.75
316	International Cow Feed	do.....	Parker & Clark, High Point.	June 18, '14	100	1.75
304	Just Corn Goods.....	Just Mills, Nashville, Tenn.	Winston Grain Co., Winston-Salem.	June 16, '14	100	1.75
170	Larro Feed.....	Larrowe Milling Co., Detroit, Mich.	W. A. Myatt, Raleigh	-----	-----	-----
268	Larro Dairy Feed.....	do.....	Geo. A. Rose Co., Henderson.	Apr. 17, '14	100	1.95
211	Model Mill Feed.....	Model Mill Co., Johnston, Tenn.	Thomas & Howard Co., Greensboro.	Mar. 30, '14	-----	-----
239	do.....	do.....	Birmingham & Co., Lumberton.	Apr. 3, '14	100	1.65
240	do.....	do.....	L. H. Caldwell, Lumberton.	Apr. 3, '14	100	1.75
228	Fine Feed.....	Mountain City Mill Co., Chattanooga, Tenn.	Wide-Awake Hay & Grain Co., Greensboro.	Mar. 30, '14	100	1.80

## NOT CONTAINING MOLASSES

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
37	Guaranteed.....	12.24		3.88		5.46		Wheat bran and screenings, corn bran.....	As guaranteed.
	Found.....	13.13	.99	4.07	.19	6.68	1.22		
227	Guaranteed.....	12.25		3.20		3.40		Wheat shorts, corn meal and bran.....	do.
	Found.....	13.00	.75	3.26	.06	2.06	-1.34		
212	Guaranteed.....	13.02		4.00		8.04			do.
	Found.....	13.13	.11	4.41	.41	3.62	-4.42	Wheat and corn products	
105	Guaranteed.....	13.25		3.50		12.50		Corn, alfalfa, wheat bran.....	As guaranteed, plus oat clips.
	Found.....	10.00	-3.25	2.50	-1.00	10.63	-1.87		
122	Guaranteed.....	12.25		8.00		14.00		Pure alfalfa and rice products.....	As guaranteed.
	Found.....	13.74	1.49	8.02	.02	15.01	1.01		
265	Guaranteed.....	16.00		5.00		15.00		Wheat middlings, peanut meal, corn meal, salt ..	do.
	Found.....	12.63	-3.37	4.94	-.06	11.20	-3.80		
112	Guaranteed.....	10.00		3.50		12.00		Alfalfa, corn, cottonseed meal, hominy feed, oats	As guaranteed except cottonseed meal.
	Found.....	10.49	.49	2.98	-.52	10.81	-1.19		
208	Guaranteed.....	10.00		3.50		12.00		Alfalfa, corn, cottonseed meal, hominy feed, oat feed.....	do.
	Found.....	10.75	.75	4.03	.53	13.45	1.45		
256	Guaranteed.....	10.00		3.50		12.00			As guaranteed
	Found.....	10.00	.00	2.96	-.54	12.61	.61	do.....	
286	Guaranteed.....	10.00		3.50		12.00			do.
	Found.....	10.63	.63	3.38	.12	10.39	-1.61	do.....	
73	Guaranteed.....	12.00		3.00		8.00		Corn and wheat bran, shorts.....	do.
	Found.....	12.50	.50	4.02	1.02	7.34	-.66		
89	Guaranteed.....	10.04		4.03		10.00		Corn cob meal and wheat product.....	do.
	Found.....	10.38	.34	2.59	-1.44	9.41	-.56		
168	Guaranteed.....	13.00		3.50		11.00		Alfalfa, corn, oats, wheat bran, cottonseed meal, salt.....	do.
	Found.....	12.75	-.25	3.21	-.29	9.00	-2.00		
153	Guaranteed.....	15.00		3.90		5.70			Crushed barley, barley hulls.
	Found.....	14.00	-1.00	3.56	.56	8.07	-2.37		
36	Guaranteed.....	9.00		2.00		12.50			As guaranteed.
	Found.....	8.38	-.62	1.71	-.29	12.35	-.15	Alfalfa, corn, oat clips.....	
203	Guaranteed.....	10.00		3.00		15.00			As guaranteed and weed and grass seed.
	Found.....	10.50	.50	2.23	-.77	18.97	3.97	do.....	
316	Guaranteed.....	16.50		3.50		14.00		Alfalfa, corn, oat clips, cottonseed meal.....	As guaranteed
	Found.....	15.63	-.87	3.07	-.43	9.75	-4.25		
304	Guaranteed.....	8.75		2.75		1.75			do.
	Found.....	7.50	-1.25	1.22	-1.53	1.05	.70	Corn goods.....	
170	Guaranteed.....	19.00		3.00		14.00		Dried distiller's grain, beet pulp, wheat bran and middlings, C. S. meal, gluten feed, corn starch, corn bran.....	do.
	Found.....	18.50	-.50	3.35	.35	11.80	-2.20		
268	Guaranteed.....	19.00		3.00		14.00			do.
	Found.....	19.00	.00	3.85	.85	11.86	-2.14	do.....	
211	Guaranteed.....	14.70		4.00		7.15		Wheat shorts and bran, corn and corn offal ..	do.
	Found.....	15.63	.93	4.66	.66	6.07	-1.08		
239	Guaranteed.....	14.70		4.00		7.15			do.
	Found.....	16.00	1.30	4.46	.46	6.30	-.85	do.....	
240	Guaranteed.....	14.70		4.00		7.15			do.
	Found.....	15.63	.93	4.58	.58	6.05	-1.10	do.....	
228	Guaranteed.....	12.50		5.50		8.50		Bran, shorts, ground screenings, corn hearts, hominy feed.....	do.
	Found.....	12.38	-.12	5.18	-.32	3.97	-4.53		

## ANALYSES OF MIXED FEEDS

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs	Price
78	Schumacher Special Horse Feed.	The Quaker Oats Co., Chicago, Ill.	The West Hill Co., Mt. Airy.	Oct. 16, '13	100	\$1.65
134	.....do.....	.....do.....	New Bern Hay, Grain & Feed Co., New Bern.	Jan. 10, '14	100	.....
209	.....do.....	.....do.....	The Patterson Co., Greensboro.	Mar. 30, '14	100	1.85
214	Schumacher Stock Feed.....	.....do.....	.....do.....	Mar. 30, '14	100	.....
261	Quaker Mule Feed.....	.....do.....	Eugene Johnson, Littleton	Apr. 16, '14	100	1.80
250	Green Cross Horse Feed.....	.....do.....	H. L. Bizzell, Goldsboro.....	Apr. 7, '14	100	1.85
277	.....do.....	.....do.....	The West Hill Co., Mt. Airy.	May 13, '14	.....	.....
140	Ideal Feed.....	D. P. Reid & Bro., Norfolk, Va.	C. G. Morris & Co., Washington.	Jan. 12, '14	100	2.00
151	Peerless Crushed Feed.....	S. D. Scott & Co., Norfolk, Va.	T. P. Nash, Elizabeth City.	Jan. 14, '14	100	.....
64	Mill Feed.....	Statesville Flour Mill Co., Statesville, N. C.	W. J. Fite, Charlotte.....	Sept. 25, '13	75	1.40
30	Peerless Feed.....	J. Allen Smith & Co., Knoxville, Tenn.	Wide-Awake Hay & Grain Store, Greensboro.	July 11, '13	.....	.....
145	Mixed Corn and Oat Feed	W. S. White, Elizabeth City, N. C.	W. S. White & Co., Elizabeth City.	Jan. 14, '14	100	1.85
6522	Mixed Feed.....	Douthat-Riddle Co., Danville, Va.	Brought in by J. W. Avent, Cary.	Oct. 19, '13	100	.....
6503	.....do.....	Bennett Milling Co., Bennett, N. C.	Sent by the manufacturers	Sept. —, '13	.....	.....
6512	.....do.....	Bonlee Milling Co., Bonlee, N. C.	.....do.....	Sept. —, '13	.....	.....
6585	Hog Feed.....	Gray R. King, Nashville, N. C.	.....do.....	Aug. —, '14	.....	.....
6518	Mill Feed.....	Farmers' Union Mill, Versailles, Ky.	Sent by the manufacturer.	Sept. —, '13	.....	.....
6546	Cow Mixture.....	J. C. Harris, Lenoir, N. C.	J. C. Harris, Lenoir.....	Feb. —, '14	.....	.....
6517	Hooker's Mule Feed.....	P. A. Hooker, Kinston, N. C.	.....do.....	Oct. —, '13	.....	.....
6535	Mixed Feed.....	Payne Bros., Kernersville, N. C.	.....do.....	Dec. —, '13	.....	.....
6548	Feed.....	Lyerly Milling Co., Cleveland, N. C.	.....do.....	Feb. —, '14	.....	.....
6566	Mill Feed.....	North State Milling Co., Greensboro, N. C.	Sent in by D. M. Prince, Greensboro.	May —, '14	100	.....
6564	.....do.....	.....do.....	Sent in by North State Milling Co., Greensboro.	May —, '14	100	.....
6565	.....do.....	.....do.....	.....do.....	Apr. —, '14	100	.....
6567	Schumacher Feed.....	Quaker Oats Co., Chicago, Ill.	Sent in by P. M. Phillips, Salisbury.	Apr. —, '14	.....	.....

## NOT CONTAINING MOLASSES—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
78	{ Guaranteed.....	10.00		4.00		8.00		Ground corn, crushed	
	{ Found.....	9.37	— .63	3.00	—1.00	7.60	— .40	oats, C. S. meal, oat	
								middlings and shorts	
								and hulls, salt.	As guaranteed.
134	{ Guaranteed.....	10.00		4.00		8.00		do.	do.
	{ Found.....	9.50	— .50	3.60	— .40	7.14	— .86	do.	do.
209	{ Guaranteed.....	9.25		3.25		8.00		do.	do.
	{ Found.....	9.38	.13	3.66	.41	5.85	—2.15	do.	do.
214	{ Guaranteed.....	10.00		3.20		9.00		Ground corn and barley,	
	{ Found.....	10.25	.25	3.45	.25	9.74	.74	wheat flour and midd-	
								lings, hominy feed, C.	
								S. meal, ground puffed	
								rice and wheat, oat	do.
								shorts, middlings, hulls.	
261	{ Guaranteed.....	10.00		3.50		12.00		Corn, oats and hulls,	
	{ Found.....	9.88	— .12	3.00	— .50	12.16	.16	alfalfa, C. S. meal	do.
250	{ Guaranteed.....	10.00		2.50		12.50		do.	do.
	{ Found.....	12.75	2.75	2.52	.02	13.92	1.92	do.	do.
277	{ Guaranteed.....	10.00		2.50		12.00		do.	do.
	{ Found.....	10.50	.50	3.00	.50	10.31	—1.69	do.	do.
140	{ Guaranteed.....	10.00		4.50		6.50		Roll oats, cracked corn	do.
	{ Found.....	10.88	.88	3.80	— .70	4.76	—1.74	Crushed oats and cracked	
151	{ Guaranteed.....	10.00		4.00		7.00		corn	do.
	{ Found.....	9.75	— .25	3.78	— .22	3.43	—3.57	Wheat bran and shorts,	As guaranteed, plus
64	{ Guaranteed.....	14.00		4.00		7.00		corn bran	wheat.
	{ Found.....	13.62	— .38	4.09	.09	7.57	.57	Wheat bran and shorts,	
30	{ Guaranteed.....	14.00		4.00		7.00		corn meal	do.
	{ Found.....	13.25	— .75	3.19	— .81	4.57	—2.43	do.	
145	{ Guaranteed.....	9.38		4.38		3.25		Cracked corn, oats.	
	{ Found.....	9.50	.12	3.32	—1.06	3.20	— .05	do.	
6522	{ Guaranteed.....	10.40		4.30		10.00		Corn cob meal and	
	{ Found.....	11.87	1.47	3.23	—1.07	11.28	1.28	wheat products	As guaranteed.
6503	{ Guaranteed.....							do.	
	{ Found.....	10.69		2.65		3.16		Corn, oats, wheat.	
6512	{ Guaranteed.....							do.	
	{ Found.....	10.63		2.79		4.82		Ground corn, oats, wheat	As guaranteed.
6586	{ Guaranteed.....							Wheat flour and wheat	
	{ Found.....	11.69		2.02		2.10		bran	do.
6518	{ Guaranteed.....							do.	
	{ Found.....	15.00		4.22		6.27		Wheat bran, small am't	
6546	{ Guaranteed.....							corn bran and screen'gs.	
	{ Found.....	16.75		4.40		7.30		Corn cob meal, C.S. meal.	As guaranteed.
6517	{ Guaranteed.....							do.	
	{ Found.....	9.00		4.18		3.55		Corn, oats, wheat bran	do.
6535	{ Guaranteed.....							do.	
	{ Found.....	12.25		4.03		4.09		Bran, shorts, corn, oats	do.
6548	{ Guaranteed.....							Wheat bran, shorts and	
	{ Found.....	13.50		2.85		4.34		screenings	do.
6566	{ Guaranteed.....	11.00		3.98		6.35		Corn bran, wheat bran	
	{ Found.....	11.88	.88	3.42	— .56	4.43	—1.92	and screenings	do.
6564	{ Guaranteed.....	11.00		3.98		6.35		do.	do.
	{ Found.....	11.38	.38	3.54	— .44	4.65	—1.70	do.	do.
6566	{ Guaranteed.....	11.00		3.98		6.35		do.	do.
	{ Found.....	11.75	.75	3.20	— .78	4.50	—1.85	do.	do.
6567	{ Guaranteed.....							do.	
	{ Found.....	10.38		3.12		6.96		Corn bran, corn chops	
								and meal, oat clips.	

## ANALYSES OF MIXED FEEDS

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package—Lbs.	Price
6507	Dixie Horse and Mule Feed.	Dabney Brokerage Co., Newport News, Va.*	Sent in by Roland & Rogers Co., Raleigh	Sept. —, '13		\$----
6560	International Dry Horse and Mule Feed.	International Sugar Feed No. 2 Co., Memphis, Tenn.	Sent in by Scott-Sparger Co., Greensboro.	Apr. —, '14		-----
6561	do.....	do.....	do.....	Apr. —, '14		-----
6562	do.....	do.....	do.....	Apr. —, '14		-----
6502	Mixed Feed.....	Universal Oil and Fertilizer Co., Wilmington, N. C.	Sent in by the company.	Sept. —, '13		-----
6581	do.....		Sent in by Walkerton Roller Mill, Walkerton.	July —, '14		-----
6521	do.....	Austin-Heaton Co., Durham, N. C.	Sent in by J. J. Green, Morrisville.	Nov. —, '13		-----
123	Fine Feed or Feed Meal	Mountain City Mill Co., Chattanooga, Tenn.	W. S. Ashworth & Son	Nov. 24, '13	75	1.60
35	Acme Feed.....	Acme Milling Co., Talbott, Tenn.	Widenhouse & Co., Kansas.	Sept. 16, '13	100	1.80
6550	Pure Corn and Oats.....		Sent in by Reed and Felton, Hertford.	Feb. —, '14		-----

## RECAPIT

	Guaranteed and Found
Maximum.....	{ Guaranteed..... Found.....
Minimum.....	{ Guaranteed..... Found.....
Average.....	{ Guaranteed..... Found.....
Discrepancy.....	{ Maximum..... Minimum..... Average.....
Number analyzed.....	{ Guaranteed..... Deficient..... Total.....

\*Of the guaranteed, not of the total.

Note that "deficient" in the case of fiber means better  
See also Note on pages 24 and 28.

## NOT CONTAINING MOLASSES—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
6507	{ Guaranteed.....								
	{ Found.....	9.88		3.13		8.27			
6560	{ Guaranteed.....	10.00		3.00		15.00		Corn, oats, alfalfa, oat	
	{ Found.....	11.63	1.63	3.17	.17	14.21	-.79	clips.....	As guaranteed.
6561	{ Guaranteed.....	1.00		3.00		15.00			
	{ Found.....	11.88	1.88	3.22	.22	13.06	-1.94	do.....	do.
6562	{ Guaranteed.....	10.00		3.00		15.00			
	{ Found.....	9.50	-.50	2.97	-.03	17.43	2.43	do.....	do.
6502	{ Guaranteed.....							Shelled peanuts, peanut	
	{ Found.....	15.13		2.60		43.50		hulls, C. S. meal.....	do.
6581	{ Guaranteed.....								
	{ Found.....	9.88		2.85		3.27			
6521	{ Guaranteed.....	15.50		4.75		6.00			
	{ Found.....	15.00	-.50	4.71	-.04	7.46	1.46	Wheat and corn products	do.
123	{ Guaranteed.....	12.50		5.50		8.50		Wheat middlings, screen-	
	{ Found.....	15.38	2.88	3.73	-1.77	4.47	-4.03	ings, corn bran.....	do.
35	{ Guaranteed.....	12.94		5.07		7.39		Wheat middlings, screen-	
	{ Found.....	14.25	1.31	4.02	-1.05	5.07	-2.32	ings, corn meal, bran....	do.
6550	{ Guaranteed.....								
	{ Found.....	9.93		4.52		4.12			

## ULATION

Protein, Per Cent	Fat, Per Cent	Fibre, Per Cent
19.00	8.00	15.00
19.00	8.02	18.97
8.75	2.00	1.75
7.50	1.22	1.05
-----	-----	-----
2.88 —3.37	1.02 —1.77	3.97 —4.53
.11 —.12	.02 —.03	.16 —.05
-----	-----	-----
47 or 79.6 per cent.	47 or 79.6 per cent.	47 or 79.6 per cent.
17 or 36 per cent.*	26 or 55 per cent.*	34 or 72 per cent.*
59		

than guarantee.

## ANALYSES OF MIXED FEEDS

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package—Lbs.	Price
244	Sucrene Dairy Feed.....	American Milling Co., Peoria, Ill.	M. J. Best & Sons, Goldsboro.	Apr. 7, '14	100	\$1.65
246	.....do.....	.....do.....	B. G. Thompson & Son, Goldsboro.	Apr. 7, '14	100	1.65
245	Sucrene Horse and Mule Feed.	.....do.....	M. J. Best & Sons, Goldsboro.	Apr. 7, '14	100	1.70
28	Sucrene Alfalfa Horse and Mule Feed.	.....do.....	W. H. Turner, Winston-Salem.	July 10, '13	.....	.....
218	Molasses Alfalfa Horse and Mule Feed.	Alfalfa Milling Co., East St. Louis, Ill.	Wide-Awake Hay & Grain Co., Greensboro.	Mar. 30, '14	100	2.00
106	Velvet Molasses Feed.....	Cairo Milling Co., Cairo, Ill.	M. J. Best & Son, Goldsboro.	Nov. 11, '13	100	.....
136	Excelsior Horse and Cattle Feed.	Colonial Cereal Co., Norfolk, Va.	C. B. Hill, New Bern.....	Jan. 10, '14	.....	.....
113	Excelsior.....	.....do.....	.....do.....	Nov. 12, '13	100	1.90
195	Balfalfa Horse and Mule Feed.	Dabney Brokerage Co., Newport News, Va.	F. D. Barkley & Co., Gastonia.	Mar. 26, '14	100	2.00
101	.....do.....	.....do.....	Deans & Moye, Goldsboro	Nov. 6, '13	100	2.00
52	.....do.....	.....do.....	The Patterson Co., Greensboro	Sept. 22, '13	100	1.85
59	Mascot Feed.....	.....do.....	.....do.....	Sept. 22, '13	100	1.75
67	Tuxedo Chops.....	Early & Daniel Co., Cincinnati, O.	Farmers' Supply Co., Charlotte.	Sept. 25, '13	100	1.90
65	Old Beek Sweet Feed .....	Edgar-Morgan Co., Memphis, Tenn.	W. J. Fite, Charlotte.....	Sept. 20, '13	100	1.80
294	.....do.....	.....do.....	Rhyme Bros., Charlotte.....	June 11, '14	.....	.....
32	Gem Sweet Feed.....	.....do.....	Asheville Grain & Hay Co., Asheville.	July 18, '13	.....	.....
275	Reliable Molasses Feed .....	Excello Feed Milling Co., St. Louis, Mo.	G. C. Lovell Co., Mt. Airy.	May 13, '14	100	1.80
76	Reliable Horse Feed .....	.....do.....	.....do.....	Oct. 16, '13	.....	.....
298	Sho-me Horse and Mule Feed.	.....do.....	Farmers' Union Agency Co., Winston-Salem.	June 16, '14	100	1.85
242	Colonial Brand Horse and Mule Feed.	New Bern Hay, Grain & Feed Co., New Bern, N.C.	New Bern Hay, Grain & Feed Co., New Bern.	Apr. 6, '14	100	1.80
114	Dan Patch.....	International Sugar Feed No. 2 Co., Memphis, Tenn.	Burrus & Co., New Bern .....	Nov. 12, '13	100	1.85
222	.....do.....	.....do.....	Thomas Howard & Co., Greensboro.	Mar. 30, '14	100	2.00
257	.....do.....	.....do.....	Southern Feed & Grocery Co., Durham.	Apr. 15, '14	100	1.90

## CONTAINING MOLASSES

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
244	{ Guaranteed. 16.50 Found..... 16.63	.13	3.50	5.86	2.36	12.00	12.07	C. S. meal, corn gluten, feed, chopped oats, molasses.	As guaranteed.
246	{ Guaranteed. 16.50 Found..... 16.50	.00	3.50	7.28	3.78	12.00	11.84	do.....	do.
245	{ Guaranteed. 9.00 Found..... 11.00	2.00	2.50	3.85	1.35	12.00	8.13	Oats, corn screenings, salt.....	do.
28	{ Guaranteed. 11.00 Found..... 10.00	-1.00	2.50	1.82	.68	12.00	11.36	Alfalfa, cracked corn, linseed meal, rolled oats and barley, re-cleaned grain, molasses	do.
218	{ Guaranteed. 9.00 Found..... 10.00	1.00	2.00	2.34	.34	13.50	12.82	Alfalfa meal, crushed oats, cracked corn, molasses.	do.
106	{ Guaranteed. 10.50 Found..... 10.37	-.13	2.50	2.80	.30	12.00	10.27	do.....	Corn, alfalfa, oat clips, molasses.
136	{ Guaranteed. 11.00 Found..... 9.75	-1.25	4.00	6.92	2.92	13.00	16.60	Corn, oats, alfalfa, middlings, molasses.....	As guaranteed.
113	{ Guaranteed. 11.00 Found..... 10.00	-1.00	4.00	4.97	.97	13.00	15.73	Cracked corn, alfalfa meal, wheat middlings, steamed meat and bone C. S. meal, molasses.	do.
195	{ Guaranteed. 10.00 Found..... 10.00	.00	3.00	2.80	-.20	12.00	10.21	Corn, oats, alfalfa, molasses.....	do.
101	{ Guaranteed. 10.00 Found..... 9.75	-.25	3.00	2.12	-.88	12.00	9.61	do.....	do.
58	{ Guaranteed. 10.00 Found..... 9.75	-.25	3.00	2.90	-.10	12.00	10.46	do.....	do.
59	{ Guaranteed. 10.00 Found..... 11.00	1.00	4.00	5.39	-1.39	13.00	12.25	Corn, oats, alfalfa, peanut brau, molasses.....	do.
67	{ Guaranteed. 12.50 Found..... 12.25	-.25	4.00	2.88	-1.12	10.00	8.12	Alfalfa, corn, oats, brewers' grains, molasses...	do.
65	{ Guaranteed. 10.00 Found..... 9.75	-.25	2.50	2.29	-.21	12.00	9.55	do.....	do.
294	{ Guaranteed. 10.00 Found..... 11.88	1.88	2.50	2.60	.10	12.00	11.45	do.....	do.
32	{ Guaranteed. 13.00 Found..... 15.00	2.00	3.00	4.86	1.86	10.00	10.18	Alfalfa, corn, C. S. meal, salt, molasses.....	do.
275	{ Guaranteed. 10.00 Found..... 10.75	.75	3.00	2.38	-.62	15.00	11.94	Alfalfa, corn, oats, salt, molasses.....	do.
76	{ Guaranteed. 10.00 Found..... 10.37	.37	3.50	2.51	-.99	15.00	9.72	Alfalfa, corn chops, oats, molasses.....	do.
298	{ Guaranteed. 10.00 Found..... 11.13	1.13	3.00	2.30	-.70	15.00	12.55	Alfalfa, corn chops, oats, salt, molasses.....	do.
242	{ Guaranteed. 10.00 Found..... 9.88	-.12	2.50	2.90	.40	13.00	11.31	C. S. meal, oat hulls, alfalfa, cracked corn, oats, wheat bran, molasses.	do.
114	{ Guaranteed. 10.00 Found..... 11.25	1.25	3.00	3.51	.51	12.50	10.78	Alfalfa, cracked corn, oats, molasses, salt.....	do.
222	{ Guaranteed. 10.00 Found..... 9.50	-.50	3.00	2.32	-.68	12.50	10.31	do.....	do.
257	{ Guaranteed. 10.00 Found..... 12.13	2.13	3.00	2.31	-.69	12.50	12.55	do.....	do.

## ANALYSES OF MIXED FEEDS

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price
38	do	do	City Feed Co., Hickory	Sept. 18, '13	100	\$1.85
129	Dan Patch Special Horse Feed.	do	Burrus & Parker, Inc., New Bern.	Jan. 10, '14	100	1.85
313	Horse and Mule Feed	do	Parker & Clark, High Point.	Jan. 18, '14	100	1.90
53	Jewel Feed	do	Southern Feed & Grocery Co., Durham.	Sept. 10, '13	100	1.65
312	do	do	Parker & Clark, High Point.	June 18, '14	100	1.75
79	Molasco	National Oats Co., St. Louis, Mo.	The West Hill Co., Mt. Airy.	Oct. 16, '13	100	1.75
111	do	do	T. P. Asheford, New Bern.	Nov. 12, '13	100	1.60
251	do	do	Southern Feed & Grocery Co., Durham.	Apr. 15, '14	100	1.90
163	Nutrilene Steam Cooked Feed.	Nutrilene Milling Co., Crowley, La.	R. A. Allen, Reidsville	Mar. 17, '14	100	1.75
169	do	do	W. A. Myatt, Raleigh			
165	Nutrilene Stock Feed	do	R. A. Allen, Reidsville	Jan. 20, '14	100	1.80
50	Cream Alfalfa Dairy Feed	Omaha Alfalfa Milling Co., Omaha, Neb.	Elmore Maxwell Co., Greensboro.	Sept. 9, '13	100	1.75
27	Green Meadow Dairy Feed.	do	W. H. Turner, Winston-Salem.	July 10, '13		
217	Dairy Molasses Feed	do	Elmore Maxwell Co., Greensboro.	Mar. 31, '14	100	2.00
289	Perfection Horse Feed	do	Charlotte Brokerage Co., Charlotte.	June 10, '14		
232	Peerless Horse Feed	do	Elmore Maxwell Co., Greensboro.	Mar. 31, '14	100	2.00
292	Peerless Alfalmo Horse F'd	do	Charlotte Brokerage Co., Charlotte.	June 10, '14	100	1.80
314	Peerless Alfalfa Horse Feed.	Omaha Alfalfa Milling Co., Omaha, Neb.	Parker and Clark, High Point.	June 18, '14	100	1.90
58	Katl-Eat-Dairy Feed	G. E. Patterson & Co., Memphis, Tenn.	Phillips & Penny, Raleigh	Sept. 10, '13	100	1.85
219	do	do	American Commission Co. Greensboro.	Mar. 30, '14	100	1.90
29	Crown Horse Feed	do	Wide-Awake Hay & Grain Co., Greensboro.	July 11, '13	100	1.70
31	Arab Horse Feed	M. C. Peters Mill Co., Omaha, Neb.	Asheville Grain & Hay Co., Asheville.	July 18, '13	100	
128	do	do	do	Nov. 24, '13	100	1.90
127	June Pasture Feed	do	do	Nov. 24, '13	100	
223	Good Molasses Feed	Purina-Ralston Co., St. Louis, Mo.	Elmore-Maxwell Co., Greensboro.	Mar. 31, '14	100	2.00
274	Purina Feed with Molasses.	do	G. C. Lovell Co., Mt. Airy.	May 13, '14	100	1.90

## CONTAINING MOLASSES—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
38	{ Guaranteed.....	10.00		4.00		12.50		Alfalfa, cracked corn,	
	{ Found.....	10.00	.00	4.07	.07	9.91	-2.59	oats, molasses, salt.....	As guaranteed
129	{ Guaranteed.....	10.00		3.00		12.50			
	{ Found.....	9.25	-.75	2.50	-.50	10.97	-1.53	do.....	do.
313	{ Guaranteed.....	12.50		3.50		12.00		Alfalfa, corn, C. S. meal,	
	{ Found.....	13.13	.63	2.86	-.64	10.37	-1.63	molasses, salt.....	do.
53	{ Guaranteed.....	9.00		2.00		12.50		Alfalfa, cracked corn, C.	
	{ Found.....	8.12	-.88	1.16	-.84	9.05	-3.45	S. meal, molasses, salt.....	do.
312	{ Guaranteed.....	8.00		2.00		12.50		Alfalfa, corn, oats, oat	
	{ Found.....	9.63	1.63	1.68	-.32	11.95	-.55	clips, molasses, salt.....	do.
79	{ Guaranteed.....	10.00		3.25		12.00		Alfalfa, corn, oat feed,	
	{ Found.....	8.43	-1.57	1.93	-1.32	11.50	-.50	C. S. meal, molasses.....	do.
111	{ Guaranteed.....	10.00		3.25		12.00			
	{ Found.....	10.00	.00	2.62	-.63	9.77	-2.23	do.....	do.
251	{ Guaranteed.....	10.00		3.25		12.00			
	{ Found.....	11.00	1.00	2.14	-1.11	14.14	2.14	do.....	do.
163	{ Guaranteed.....	10.00		3.50		12.00		Alfalfa, corn, rice bran	
	{ Found.....	9.13	-.87	4.90	1.40	6.75	-5.25	C. S. meal, molasses.....	do.
169	{ Guaranteed.....	10.00		3.50		12.00			
	{ Found.....	10.13	.13	6.15	2.65	7.83	-4.17	do.....	do.
165	{ Guaranteed.....	10.00		3.50		12.00			
	{ Found.....	8.25	-1.75	5.22	1.72	8.82	-3.18	do.....	As guaranteed, except C.
50	{ Guaranteed.....	11.00		2.25		15.00		Alfalfa, meal, corn, mo-	S. meal.
	{ Found.....	11.37	.37	.83	-1.42	6.31	-8.69	lasses.....	do.
27	{ Guaranteed.....	11.00		1.00		25.00			
	{ Found.....	14.75	3.75	.89	-.11	16.60	-8.40	Alfalfa, meal, molasses.....	do.
217	{ Guaranteed.....	11.00		2.00		15.00		Alfalfa, cracked corn,	
	{ Found.....	11.88	.88	1.10	-.90	12.75	-2.25	oats, molasses.....	do.
289	{ Guaranteed.....	10.00		2.00		12.00		Alfalfa, corn, oats, mo-	
	{ Found.....	11.88	.88	2.80	.80	12.62	.62	lasses.....	do.
232	{ Guaranteed.....	10.00		2.00		12.00			
	{ Found.....	12.38	2.38	2.56	.56	13.17	1.17	do.....	do.
292	{ Guaranteed.....	10.00		2.00		12.00			
	{ Found.....	10.38	.38	1.92	-.08	13.42	1.42	do.....	do.
314	{ Guaranteed.....	10.00		2.00		12.00			
	{ Found.....	9.75	-.25	1.82	-.18	11.51	-.49	do.....	do.
56	{ Guaranteed.....	15.00		3.00		12.00		Alfalfa, corn, C. S. meal	
	{ Found.....	14.37	-.63	2.19	-.81	8.89	-3.11	rice straw, molasses.....	do.
219	{ Guaranteed.....	15.00		3.00		12.00			
	{ Found.....	15.38	.38	3.12	.12	13.51	1.51	do.....	do.
29	{ Guaranteed.....	9.00		2.00		12.00		Alfalfa, corn, oats, mo-	
	{ Found.....	9.13	.13	2.44	.44	8.03	-3.97	lasses.....	do.
31	{ Guaranteed.....	10.00		2.00		15.00			
	{ Found.....	11.63	1.63	2.21	.21	8.30	-6.70	do.....	do.
128	{ Guaranteed.....	10.00		2.00		15.00			
	{ Found.....	10.63	.63	2.19	.19	10.50	-4.50	do.....	do.
127	{ Guaranteed.....	10.00		.50		26.00			
	{ Found.....	14.50	4.50	.87	.37	16.69	-9.31	Alfalfa, molasses.....	do.
223	{ Guaranteed.....	9.00		1.50		12.00		Alfalfa, corn, oats,	
	{ Found.....	10.63	1.63	2.16	.66	7.69	-4.31	ground screenings, salt,	do.
								molasses.....	
274	{ Guaranteed.....	9.30		1.70		11.70		Alfalfa, corn, oats, salt,	
	{ Found.....	10.13	.83	2.47	.77	9.44	-2.26	molasses.....	do.

## ANALYSES OF MIXED FEEDS

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package—Lbs.	Price
311	Big Mule Molasses Feed ..	The Quaker Oats Co., Chicago, Ill.	W. H. Turner, Winston-Salem.	June 16, '14	100	\$1.90
241	Green Cross Horse Feed ..	do.....	L. H. Caldwell, Lumberton.	Apr. 3, '14	100	2.25
205	do.....	do.....	The Patterson Co., Greensboro.	Mar. 30, '14	100	1.75
103	Green Cross Molasses Mixed Feed.	do.....	H. L. Bizzell, Goldsboro.	Nov. 6, '13	100	1.90
295	Mogul Molasses Mixed Feed.	do.....	Adams Grain & Produce Co., Charlotte.	June 11, '14	100	1.85
130	do.....	do.....	T. P. Asheford, New Bern.	Jan. 10, '14	100	.....
315	Quaker Molasses Dairy Feed.	do.....	Parker & Clark, High Point.	June 18, '14	100	1.75
160	do.....	do.....	Spray Mercantile Co., Spray.	Jan. 20, '14	100	1.75
148	Purina Molasses Feed.....	Ralston-Purina Co., St. Louis, Mo.	W. S. White & Co., Elizabeth City.	Jan. 14, '14	100	.....
110	do.....	do.....	Ray Dawson, Kinston.....	Nov. 8, '13	100	1.85
225	XX Good Molasses Feed.....	do.....	Southern Feed & Grocery Co., Durham.	Apr. 15, '14	100	1.90
234	Krak-a-Jak Horse Feed ..	The Superior Feed Co., Memphis, Tenn.	Wide-Awake Hay & Grain Co., Greensboro.	May 30, '14	100	1.80
305	Molasses Horse and Mule Feed.	J. H. Wilkes & Co., Nashville, Tenn.	Winston Grain Co., Winston-Salem.	June 16, '14	100	1.80
6540	Mixed Feed (lot D).....	Applewhite & Rowan, Wilmington, N. C.	Applewhite & Rowan, Wilmington.	Dec. —, '13	.....	.....
6541	Mixed Feed (lot 6).....	do.....	do.....	Dec. —, '13	.....	.....
6537	Sucrene Dairy Feed.....	do.....	J. W. Robinson, Newton..	Dec. —, '13	.....	.....
6534	*Peanut Hull Feed.....	Dabney Brokerage Co., Newport News, Va.	Sent in by the manufacturer.	Dec. —, '13	.....	.....
6579	†X-tra Vim.....	X-tra Vim Feed Co., Boston, Mass.	do.....	June —, '14	.....	.....
6580	Sphagnum Moss.....	do.....	do.....	June —, '14	.....	.....
6545	†CXX Feed.....	Postum Cereal Co., Battle Creek, Mich.	do.....	Feb. —, '14	.....	.....

\*6534 Proposed but not on the North Carolina market.

†6580 Proposed but not licensed on the North Carolina market.

## CONTAINING MOLASSES—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
311	{ Guaranteed. 10.00 Found..... 11.50	10.00 11.50	1.50	3.00 3.17	.17	15.00 11.83	—3.17	Alfalfa, cracked corn, crushed oats, oat middlings and hulls, grain screenings, molasses.	As guaranteed.
241	{ Guaranteed. 10.00 Found..... 11.63	10.00 11.63	1.63	2.50 2.73	.23	12.00 12.95	.95	Alfalfa, corn, oats, C. S. meal, molasses.	do.
205	{ Guaranteed. 10.00 Found..... 11.50	10.00 11.50	1.50	2.50 1.68	— .82	12.00 11.25	— .75	do.	do.
103	{ Guaranteed. 10.00 Found..... 9.75	10.00 9.75	— .25	2.50 3.00	.00	10.50 8.87	—1.63	Alfalfa, corn, oats, oat meal, molasses.	do.
295	{ Guaranteed. 10.00 Found..... 11.50	10.00 11.50	1.50	3.00 2.34	— .66	10.00 12.80	2.80	Alfalfa, corn, oats and hulls, C. S. meal, molasses.	do.
130	{ Guaranteed. 10.00 Found..... 12.00	10.00 12.00	2.00	3.00 2.75	— .25	15.00 13.40	—1.60	do.	do.
315	{ Guaranteed. 16.00 Found..... 15.38	16.00 15.38	— .62	4.00 4.69	.69	14.50 10.52	—3.98	Malt sprouts, C. S. meal, ground grain, screenings, clipped out by-product, molasses.	do.
160	{ Guaranteed. 16.00 Found..... 16.63	16.00 16.63	.63	4.00 5.65	1.65	14.50 11.15	—3.35	do.	do.
148	{ Guaranteed. 9.00 Found..... 10.63	9.00 10.63	1.63	1.50 2.65	1.15	12.00 12.00	.00	Alfalfa, cracked corn, oats, molasses.	do.
110	{ Guaranteed. 9.00 Found..... 10.75	9.00 10.75	1.75	1.50 2.49	.99	13.00 10.41	—1.59	do.	do.
252	{ Guaranteed. 9.00 Found..... 10.25	9.00 10.25	.75	1.50 2.16	.66	13.00 8.70	—4.30	do.	do.
234	{ Guaranteed. 10.00 Found..... 9.00	10.00 9.00	—1.00	2.50 2.36	— .14	15.00 10.60	—4.40	Alfalfa, corn, oats, and oat feed, molasses.	do.
305	{ Guaranteed. 10.00 Found..... 9.63	10.00 9.63	— .37	2.10 2.45	.35	12.00 9.62	—2.38	Alfalfa, corn, oats, molasses.	do.
6540	{ Guaranteed. .... Found..... 11.87	..... 11.87		2.66		11.87			Alfalfa, cracked corn, crushed oats, oat hulls, molasses.
6541	{ Guaranteed. .... Found..... 10.25	..... 10.25		1.88		11.30			do.
6537	{ Guaranteed. .... Found..... 17.25	..... 17.25		4.56		5.22			
6534	{ Guaranteed. 12.00 Found..... 11.63	12.00 11.63	— .37	3.00 2.75	— .25	20.00 14.96	—5.04	Ground peanut hulls, C. S. meal, corn meal, molasses.	As guaranteed.
6579	{ Guaranteed. 4.61 Found..... 7.13	4.61 7.13	2.52	.81 .80	— .01	4.50 8.65	4.15	Molasses and sphagnum moss (or peat).	do.
6580	{ Guaranteed. .... Found..... 5.33	..... 5.33		3.34		20.60		Sphagnum moss.	do.
6545	{ Guaranteed. 15.00 Found..... 17.81	15.00 17.81	2.81	2.00 3.33	1.33	24.00 13.00	—11.00	Wheat bran and molasses.	do.

## RECAPIT

	Guaranteed and Found
Maximum.....	{ Guaranteed.....
	{ Found.....
Minimum.....	{ Guaranteed.....
	{ Found.....
Average.....	{ .....
	{ .....
Discrepancy.....	{ Maximum.....
	{ Minimum.....
	{ Average.....
	{ Guaranteed.....
Number analyzed.....	{ Deficient.....
	{ Total.....

\*Per cent of the guaranteed, not of total analyzed.

Note: "Deficient" here means below guarantee, and,  
See also Note on pages 24 and 28.

## ULATION

Protein, Per Cent		Fat, Per Cent		Fibre, Per Cent	
16.50		4.00		26.00	
17.81		7.28		16.60	
8.00		.50		10.00	
8.12		.87		5.22	
4.50		3.78		3.60	
—1.75		—1.42		—11.00	
.13		.07		.05	
— .25		— .08		— .16	
63 or 91	per cent.	63 or 91	per cent.	63 or 91	per cent.
21 or 33	per cent.*	29 or 46	per cent.*	50 or 79	per cent.*
69		69		69	

in the case of fiber, means also better than guarantee.

## ANALYSES OF

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price
213	Cluck-Cluck Scratch Feed	American Milling Co., Peoria, Ill.	The Patterson Co., Greensboro.	Mar. 30, '14	100	\$2.00
248	Prize Poultry Feed.....	Cairo Milling Co., Cairo, Ill.	B. G. Thompson & Son, Goldsboro.	Apr. 7, '14	100	2.25
238	Chamber Pure Hen Feed.	W. F. Chamberlain Feed Co., St. Louis, Mo.	Brougham & Co., Inc., Lumberton.	Apr. 3, '14	100	2.20
204	Corno Chick Feed.....	The Corno Mills Co., East St. Louis, Mo.	The Patterson Co., Greensboro.	Mar. 30, '14	100	2.30
220	Corno Hen Feed.....	do.....	do.....	Mar. 30, '14	100	2.25
6559	Red Comb Chick Feed ...	Cochrane-McLaughlin Co., Charlotte, N. C.	Sent in by the company...	Mar. 30, '14	-----	-----
296	Pine Tree Scratch Feed...	Albert Dickenson Co., Chicago, Ill.	Adams Grain & Produce Co., Charlotte.	June 11, '14	100	2.25
302	Amco Chick Feed.....	Davis, Robinson Co., Roanoke, Va.	Farmers' Union Agency Co., Winston-Salem.	June 16, '14	100	2.50
187	Manna Rice Special Chick Feed.	Edgar-Morgan Co., Memphis, Tenn.	W. M. Neel & Co., Mooresville.	Mar. 25, '14	100	2.40
198	Manna Hen Feed.....	do.....	do.....	Mar. 25, '14	100	2.35
6570	Chick Grow.....	Hen-Cackle Poultry & Supply Co., Raleigh, N. C.	Sent in by the company...	May --, '14	-----	-----
280	Hen-o-la Dry Mash.....	Hen-e-ta Bone Co., Flemington, W. Va.	Blair & Co., North Wilkesboro.	May 25, '14	100	3.00
279	Hen-e-ta.....	do.....	do.....	May 25, '14	-----	3.50
40	International Poultry Feed.	International Sugar Feed No. 2 Co., Memphis, Tenn.	City Feed Co., Hickory....	Sept. 18, '13	100	2.10
194	Little Jo Scratch Feed...	Just Mills Branch of Ralston Purina Co., Nashville, Tenn.	Harris & McNeely, Mooresville.	Mar. 25, '14	100	2.40
221	do.....	Just Milling Co., Nashville, Tenn.	Wide-Awake Hay & Grain Co., Greensboro.	Mar. 30, '14	100	2.00
210	Nutro Hen Feed.....	National Oats Co., St. Louis, Mo.	The Patterson Co., Greensboro.	Mar. 30, '14	100	2.20
291	Eg-Mo. Scratch Feed.....	G. E. Patterson & Co., Memphis, Tenn.	Charlotte Brokerage Co., Charlotte.	June 10, '14	100	2.25
306	Purina Chicken Chowder.	Purina Mills, St. Louis, Mo.	Winston Grain Co., Winston-Salem.	June 16, '14	100	2.35
224	Red Ribbon Scratch Feed.	Park & Pollard Co., Boston, Mass.	The Patterson Co., Greensboro.	Mar. 30, '14	100	2.10
200	Big Egg Scratch Feed ...	Quaker Oats Co., Chicago, Ill.	F. D. Barkley & Co., Gastonia.	Mar. 26, '14	100	2.25

## POULTRY FEEDS

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
213	{ Guaranteed..	10.00		3.00		5.00		Cracked corn, Kaffir corn,	
	{ Found.....	12.25	2.25	3.31	.31	2.57	-2.43	wheat, buckwheat .....	As guaranteed.
248	{ Guaranteed..	10.00		3.50		6.00		Cracked corn, oats,	
	{ Found.....	10.50	.50	4.22	.72	3.26	-2.74	wheat, sunflower seed..	do.
238	{ Guaranteed..	10.00		3.50		6.00		Barley, Kaffir corn, oats,	
	{ Found.....	11.38	1.38	3.98	.48	4.61	-1.39	wheat, sunflower seed..	do.
204	{ Guaranteed..	10.75		2.75		3.00		Kaffir, wheat, millet,	
	{ Found.....	10.50	-.25	2.89	.14	2.42	-.58	sunflower seed.....	do.
220	{ Guaranteed..	10.00		3.50		5.00		Kaffir corn, wheat, sun-	
	{ Found.....	11.75	1.75	4.15	.65	2.73	-2.27	flower seed.....	do.
6559	{ Guaranteed..							Cracked corn, Kaffir	
	{ Found.....	11.25		3.23		2.30		corn, wheat.....	do.
296	{ Guaranteed..	10.00		2.50		5.00		Cracked corn, oats, bar-	
	{ Found.....	10.63	.63	3.41	.91	3.28	-1.72	ley, rye, wheat, sun-	do.
								flower seed.	
302	{ Guaranteed..	10.00		2.50		5.00		Cracked corn, oats, milo	
	{ Found.....	11.50	1.50	2.71	.21	1.80	-3.20	maize, millet seed, grit.	do.
187	{ Guaranteed..	11.00		2.50		4.00			
	{ Found.....	12.88	1.88	2.24	-.26	2.75	-1.25	Wheat, rice, Kaffir corn..	do.
198	{ Guaranteed..	10.00		3.50		5.00		Wheat, corn, Kaffir corn,	
	{ Found.....	9.75	-.25	3.35	-.15	5.00	.00	barley, oats.....	do.
								Wheat bran, white midd-	
6570	{ Guaranteed..							lings, corn meal, ground	
	{ Found.....	17.13		4.24		5.50		oats, alfalfa, bone and	
								meat meal, oyster	
								shells, charcoal, salt.	do.
280	{ Guaranteed..	12.00		3.00		4.00		Corn meal, gluten, midd-	
	{ Found.....	12.00	.00	3.00	.00	3.52	-.48	lings, bran, oat meal,	do.
								and Hen-e-ta.	
279	{ Guaranteed..	.00		.00		.00		A mixture of phosphate	
	{ Found.....	.00		.00		.00		rock, silica and soda-	
								ash fluxed at high tem-	
								perature; 30% of trical-	
								cium phosphate.	Found: 30% of tri-cal-
40	{ Guaranteed..	10.00		3.50		5.00		Corn, oats, wheat, Kaffir	
	{ Found.....	12.00	2.00	1.99	-1.51	3.18	-1.82	corn, sunflower seed ...	As guaranteed
194	{ Guaranteed..	9.00		3.00		4.00		Wheat, cracked corn,	
	{ Found.....	10.25	1.25	3.68	.68	2.42	-1.58	screenings, oats, Kaffir	
								corn, sunflower seed,	do.
								grit.	
221	{ Guaranteed..	9.00		3.00		4.00		Wheat, cracked kaffir corn	
	{ Found.....	11.13	2.13	4.63	1.63	3.13	-.87	oats, sunflower seed, grit	do.
210	{ Guaranteed..	10.00		3.50		5.00		Wheat, Kaffir corn, wild	
	{ Found.....	10.88	.88	3.51	.01	2.85	-2.15	buckwheat, sunflower	do.
								seed.	
291	{ Guaranteed..	10.00		2.50		3.00			
	{ Found.....	12.00	2.00	2.57	.07	2.91	-.09	Corn, oats, rye, wheat...	do.
306	{ Guaranteed..	17.00		3.00		9.00		Wheat middlings, and	
	{ Found.....	17.00	.00	4.89	1.89	6.62	-2.38	bran meal, granulated	
								meat, alfalfa.	do.
224	{ Guaranteed..	10.00		3.50		5.00		Cracked corn, wheat, bar-	
	{ Found.....	10.75	.75	2.95	-.55	2.77	-2.23	ley, sunflower seed.	do.
200	{ Guaranteed..	10.00		2.50		5.00		Wheat, cracked corn,	
	{ Found.....	11.75	1.75	4.31	1.81	3.75	-1.25	barley, oats, sunflower	do.
								seed.	

## ANALYSES OF

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price
230	Chicken Feed.....	Ralston-Purina Co., St. Louis, Mo.	Elmore-Maxwell Co., Greensboro.	Mar. 31, '14	100	\$2.30
259	Superior Laying Feed.....	Superior Feed Co., Memphis, Tenn.	Littleton Feed & Grocery Co., Littleton.	Apr. 16, '14	100	2.35
310	Turners Chick Feed.....	W. H. Turner, Winston-Salem, N. C.	Sent in by the manufacturer.	June 16, '14	100	2.50
6553	Sims' Dry Mash.....	J. F. Sims, Asheville, N. C.	do.....	Apr. —, '14		
39	Scratch Food.....	J. H. Walker & Co., Nashville, Tenn.	City Feed Co., Hickory.....	Sept. 18, '13	100	2.40
6530	Steinmesch Mixed Feed....	Steinmesch Feed Co., St. Louis, Mo.	Sent in by the manufacturer.	Dec. —, '13		

## RECAPIT

	Guaranteed and Found
Maximum.....	{ Guaranteed..... Found.....
Minimum.....	{ Guaranteed..... Found.....
Average.....	{ Guaranteed..... Found.....
Discrepancy.....	{ Maximum..... Minimum..... Average.....
Number analyzed.....	{ Guaranteed..... Deficient..... Total.....

\*Per cent of the guaranteed, not of total analyzed.

Note: "Deficient" means below guarantee and also, See also Note on pages 24 and 28.

## POULTRY FEEDS—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
230	{ Guaranteed.....	11.00		3.00		4.00		Wheat, cracked corn, barley, milo maize, millet.	As guaranteed
	{ Found.....	11.88	.88	3.50	.50	2.43	-1.57		
259	{ Guaranteed.....	10.00		3.25		4.50		Wheat, cracked corn, Kaffir corn, milo maize, sunflower seed.	do.
	{ Found.....	10.88	.88	2.66	-.59	3.65	-.85		
310	{ Guaranteed.....	10.00		3.50		4.00		Wheat, cracked corn, Kaffir corn, shells.....	do.
	{ Found.....	10.63	.63	2.82	-.68	2.01	-1.99		
6553	{ Guaranteed.....	19.57		5.00		6.00		Alfalfa meal, meat scrap, blood meal, bone meal, oat meal, corn meal, gluten meal, Diamond Hog Meal, flaxseed meal, wheat bran.	do.
	{ Found.....	19.63	.06	5.33	.33	5.26	-.74		
39	{ Guaranteed.....	10.00		3.48		8.46		Sunflower seed, oats, corn, wheat, Kaffir corn.	do.
	{ Found.....	9.25	-.75	3.51	.03	2.25	-6.21		
6530	{ Guaranteed.....	10.00		3.50		6.00		Oats, corn, sunflower wheat screenings, wheat, Kaffir corn, barley.	do.
	{ Found.....	10.87	.87	3.19	-.31	3.97	-2.03		

## ULATION

Protein, Per Cent	Fat, Per Cent	Fibre, Per Cent
19.57	5.00	9.00
19.63	5.33	6.62
9.00	2.50	3.00
9.25	1.99	1.80
-----	-----	-----
2.25 — .87	1.89 —1.51	----- —6.21
.06 — .25	.01 — .15	----- —.09
-----	-----	-----
24 or 92 per cent.	24 or 92 per cent.	24 or 92 per cent.
4 or 16.6 per cent.*	7 or 29 per cent.*	23 or 96 per cent.*
26	26	26

in case of fiber, means better than guarantee.

## ANALYSES OF COTTON SEED MEAL

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price
121	Cotton Seed Meal.....	Farmville Oil & Fertilizer Co., Farmville, N. C.	L. M. Savage, Greenville...	Nov. 11, '13	100	\$1.75
115	.....do.....	New Bern Cotton Oil & Fertilizer Co., New Bern, N. C.	Burrus & Co., New Bern...	Nov. 12, '13	100	1.70
104	.....do.....	Southern Cotton Oil Co., Goldsboro, N. C.	H. L. Bizzell, Goldsboro...	Nov. 6, '13	-----	-----
6538	.....do.....	Farmers Cotton Oil Co., Wilson, N. C.	Brought in by R. S. Curtis, Raleigh.	Dec. —, '13	-----	-----
6539	.....do.....	.....do.....	.....do.....	Dec. —, '13	-----	-----
6582	.....do.....	-----	Sent in by G. E. Bobinett, Rural Hall.	July 1, '14	-----	-----
6585	.....do.....	-----	Sent in by O. D. McNeel, Mt. Gilead.	July 23, '14	-----	-----
6584	.....do.....	-----	Sent in by J. N. Paine, Statesville.	July 23, '14	-----	-----
74	.....do.....	-----	-----	-----	-----	-----
6578	Cotton Seed Feed Meal...	South Carolina Cotton Oil Co., Greenville, S. C.	Sent in by S. M. Garven, Biltmore.	June —, '14	-----	-----
255	Cyclone Cotton Seed Feed	American Cotton Seed Hull & Fiber Co., Memphis, Tenn.	Southern Feed & Grocery Co., Durham.	Apr. 15, '14	100	1.50
182	Durham Brand Cotton Seed Feed.	Florida Cotton Oil Co., Jacksonville, Fla.	F. D. Forrester & Co., Wilkesboro.	Mar. 18, '14	100	1.55
152	Cremo Brand Cotton Seed Feed.	Tennessee Fiber Co., Memphis, Tenn.	A. T. Rothrock, Walnut Cove.	Jan. 20, '14	100	1.60
172	.....do.....	.....do.....	A. A. Maynard & Johnson, Kerr.	Feb. 10, '14	100	-----
181	.....do.....	.....do.....	Grimes Bro., Lexington...	Mar. 13, '14	100	-----
173	Sico Cold Pressed Feed Meal.	Sea Island Cotton Oil Co., Charleston, S. C.	Hardison Co., Wadesboro...	Feb. 12, '14	100	-----
6505	Cotton Seed Feed.....	-----	F. D. Barkley & Co., Gastonia.	Sept. —, '13	-----	-----
6552	.....do.....	-----	C. I. Robinson, Clear Run.	Mar. —, '14	-----	-----
6532	Cotton Seed and Hulls...	-----	W. J. Blalock, Norwood...	Dec. —, '13	-----	-----

## AND COTTON SEED FEED

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
121	{ Guaranteed. 38.56								
	{ Found..... 37.51	-1.07		7.02		11.27			
115	{ Guaranteed. 38.56								
	{ Found..... 39.12	.56		9.25		8.42			
104	{ Guaranteed. 38.56								
	{ Found..... 36.31	-2.25		8.54		10.70			
6538	{ Guaranteed. 38.56								
	{ Found..... 39.87			8.60		9.22			
6539	{ Guaranteed. 38.56								
	{ Found..... 32.95			7.71		13.00			
6582	{ Guaranteed. 38.56								
	{ Found..... 31.88			7.35		11.40			
6585	{ Guaranteed. 38.56								
	{ Found..... 35.30			4.76		11.67			
6584	{ Guaranteed. 38.56								
	{ Found..... 34.62	-3.94		9.49		9.95			
74	{ Guaranteed. 38.56								
	{ Found..... 37.62			6.65		10.95			
6578	{ Guaranteed. 36.00			5.00		12.00			
	{ Found..... 37.19	1.19		8.25	3.25	7.78	-4.22		
255	{ Guaranteed. 20.00			3.00		23.00		C. S. meal, C. S. hulls,	
	{ Found..... 20.63	.63		3.76	.76	21.21	-1.79	bran.....	
182	{ Guaranteed. 25.00			6.00		20.00			
	{ Found..... 24.25	-.75		7.56	1.56	15.88	-4.12	C. S. meal, C. S. hulls...	
152	{ Guaranteed. 20.00			5.00		22.00		C. S. meal, C. S. hulls,	
	{ Found..... 22.88	2.88		4.41	-.59	20.59	-1.50	bran.....	
172	{ Guaranteed. 20.00			5.00		22.00			
	{ Found..... 23.13	3.13		4.42	-.58	20.15	-1.85		
181	{ Guaranteed. 20.00			5.00		22.00			
	{ Found..... 24.50	4.50		4.75	-.25	18.05	-3.95		
173	{ Guaranteed. 25.00			6.00		20.00			
	{ Found..... 27.76	2.76		6.65	.65	15.27	-4.73		
6505	{ Guaranteed. 38.56								
	{ Found..... 35.63			7.00		9.98			
6552	{ Guaranteed. 38.56								
	{ Found..... 18.75			3.83		23.13			
6532	{ Guaranteed. 38.56								
	{ Found..... 16.87			3.45		24.80			

## RECAPIT

	Guaranteed and Found
Maximum.....	{ Guaranteed..... Found.....
Minimum.....	{ Guaranteed..... Found.....
Average.....	{ Guaranteed..... Found.....
Discrepancy.....	{ Maximum..... Minimum..... Average.....
Number analyzed.....	{ Guaranteed..... Deficient..... Total.....

\*Per cent of the guaranteed, not of the total analyzed.

Note: "Deficient" means below guarantee and, in the

See also Note on pages 24 and 28.

## ULATION

Protein, Per Cent		Fat, Per Cent		Fibre, Per Cent	
38.56		6.00		23.00	
39.87		9.49		24.80	
20.00		3.00		12.00	
16.87		3.83		7.78	
-----		-----		-----	
4.50	-3.94	3.25	-.59	-----	-4.73
.56	-.75	.65	-.25	-----	-1.50
-----		-----		-----	
11 or 58	per cent.	7 or 37	per cent.	7 or 37	per cent.
4 or 36	per cent.*	3 or 43	per cent.*	7 or 100	per cent.*
19		19		19	

case of fiber, means also better than guarantee.

## ANALYSES OF CORN, CRACKED

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package—Lbs.	Price
6574	Whole Corn.....	North State Milling Co., Greensboro, N. C.	North State Milling Co., Greensboro.	May —, '14	-----	\$-----
290	Cracked Corn.....	City Hay & Grain Co., Norfolk, Va.	Charlotte Brokerage Co., Charlotte.	June 10, '14	75	1.40
143	do.....	Jonathan Haven, Washington, N. C.	E. Peterson Co., Washington.	Jan. 12, '14	100	1.80
144	do.....	D. P. Reid & Bro., Norfolk, Va.	J. A. Woodard-Holmes Co., Edenton.	June 14, '14	-----	-----
149	do.....	W. S. White & Co., Elizabeth City, N. C.	W. S. White & Co., Elizabeth City.	June 14, '14	100	-----
132	do.....	New Bern Hay, Grain & Feed Co., New Bern, N. C.	New Bern Hay, Grain & Feed Co., New Bern.	Jan. 10, '14	-----	-----
133	Corn Chops.....	do.....	do.....	Jan. 10, '14	-----	-----
131	Corn Bran and Cracked Corn.	do.....	do.....	Jan. 10, '14	-----	-----
6544	Cracked Corn.....	do.....	do.....	Feb. —, '14	-----	-----
6554	Pure Corn Chops.....	Jno. L. Ratcliff, Pantego, N. C.	Jno. L. Ratcliff, Pantego.	Oct. —, '13	-----	-----
6513	Pure Corn Hominy or Chops.	do.....	do.....	Sept. —, '13	-----	-----
6558	Corn Chops.....	J. D. Anderson, Tobacco-ville, N. C.	J. D. Anderson, Tobacco-ville.	Mar. —, '14	-----	-----
6504	Hominy or Chops.....	-----	Belhaven Grain & Commission Co., Belhaven.	Aug. —, '13	-----	-----
6575	Corn Bran.....	North State Milling Co., Greensboro, N. C.	North State Milling Co., Greensboro.	May —, '14	-----	-----

## RECAPIT

	Guaranteed and Found
Maximum.....	{ Guaranteed..... Found.....
Minimum.....	{ Guaranteed..... Found.....
Average.....	{ Guaranteed..... Found.....
Discrepancy.....	{ Maximum..... Minimum..... Average.....
Number analyzed.....	{ Guaranteed..... Deficient..... Total.....

\*Per cent of the guaranteed, not of the total analyzed  
 Note: "Deficient" means here below guarantee and  
 See also Note on pages 24 and 28.

## CORN, CORN CHOPS. CORN BRAN

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
6574	{ Guaranteed.....	-----	-----	-----	-----	-----	-----	-----	-----
	{ Found.....	9.38		3.61		1.85		-----	Whole corn.
290	{ Guaranteed.....	8.00		3.00		5.00		-----	-----
	{ Found.....	8.75	.75	3.26	.26	1.64	-3.34	Cracked corn.....	Cracked corn.
143	{ Guaranteed.....	8.00		3.00		3.00		-----	-----
	{ Found.....	8.50	.50	2.46	-.54	1.58	-1.42	do.....	do.
144	{ Guaranteed.....	8.00		4.00		6.00		-----	-----
	{ Found.....	7.38	-.62	2.99	-1.01	2.06	-3.94	do.....	do.
149	{ Guaranteed.....	8.75		4.53		1.99		-----	-----
	{ Found.....	8.00	-.75	3.84	-.69	1.95	-.04	do.....	do.
132	{ Guaranteed.....	-----	-----	-----	-----	-----	-----	-----	-----
	{ Found.....	9.50		1.65		3.63		-----	-----
133	{ Guaranteed.....	-----	-----	-----	-----	-----	-----	-----	-----
	{ Found.....	9.37		7.20		2.00		-----	-----
131	{ Guaranteed.....	-----	-----	-----	-----	-----	-----	Corn bran and cracked corn.....	-----
	{ Found.....	8.62		2.82		9.28		-----	-----
6544	{ Guaranteed.....	-----	-----	-----	-----	-----	-----	-----	-----
	{ Found.....	9.75		4.54		1.42		-----	-----
6554	{ Guaranteed.....	-----	-----	-----	-----	-----	-----	-----	-----
	{ Found.....	8.98		4.30		1.85		Made out of pure corn.....	-----
6513	{ Guaranteed.....	-----	-----	-----	-----	-----	-----	-----	-----
	{ Found.....	8.63		4.11		1.81		Pure corn hominy.....	-----
6558	{ Guaranteed.....	-----	-----	-----	-----	-----	-----	-----	-----
	{ Found.....	8.70		4.54		2.07		-----	-----
6504	{ Guaranteed.....	-----	-----	-----	-----	-----	-----	-----	-----
	{ Found.....	8.00		4.61		1.91		Made out of pure corn.....	-----
6575	{ Guaranteed.....	-----	-----	-----	-----	-----	-----	-----	-----
	{ Found.....	8.31		2.96		7.86		-----	-----

## ULATION

Protein, Per Cent	Fat, Per Cent	Fibre, Per Cent
8.75	4.53	6.00
9.75	7.20	9.28
8.00	3.00	1.99
7.38	1.65	1.42
-----	-----	-----
.75 — .75	.26 — 1.01	----- — 3.94
.50 — .62	----- — .54	----- — .04
-----	-----	-----
4 or 28.6 per cent.	4 or 28.6 per cent.	4 or 28.6 per cent.
2 or 50 per cent.*	3 or 75 per cent.*	4 or 100 per cent.*
14	14	14

in the case of fiber, means also better than guarantee.

## ANALYSES OF BUFFALO

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price
95	Buffalo Gluten Feed.....	Corn Products Refining Co., New York, N. Y.	John S. McEachern Sons, Wilmington.	Nov. 8, '13	100	\$....
150	Dried Beet Pulp.....	German-American Sugar Co., Bay City, Mich.	W. S. White & Co., Elizabeth City.	Jan. 14, '14	100	....
207	...do.....	Larrowe Milling Co., Detroit, Mich.	Wide-Awake Hay & Grain Co., Greensboro.	Mar. 30, '14	100	1.75
206	...do.....	...do.....	The Patterson Co., Greensboro.	Mar. 30, '14	100	2.00
233	...do.....	...do.....	Elmore-Maxwell Co., Greensboro.	Mar. 31, '14	100	2.00
116	...do.....	Charles Pope, Riverdale, Ill.	Job P. Wyatt's Sons Co., Raleigh.	Nov. 21, '13	100	1.75

## RECAPIT

	Guaranteed and Found
Maximum.....	{ Guaranteed..... Found.....
Minimum.....	{ Guaranteed..... Found.....
Average.....	{ Guaranteed..... Found.....
Discrepancy.....	{ Maximum..... Minimum..... Average.....
Number analyzed.....	{ Guaranteed..... Deficient..... Total.....

Note that "deficient" in fiber means better than  
See also Note on pages 24 and 28.

## GLUTEN FEED, BEET PULP

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
95	{ Guaranteed.	23.00		2.00		8.50			
	{ Found.....	27.12	4.12	4.00	2.00	5.96	-2.54		
150	{ Guaranteed.	8.00		.50		20.00			
	{ Found.....	7.25	— .25	.76	.26	18.60	-1.40		
207	{ Guaranteed.	8.00		.50		20.00			
	{ Found.....	8.00	.00	.90	.40	17.47	-2.53		
206	{ Guaranteed.	8.00		.50		20.00			
	{ Found.....	8.63	.63	.85	.35	17.18			
233	{ Guaranteed.	8.00		.50		20.00			
	{ Found.....	8.94	.94	1.00	.50	17.47	-2.53		
116	{ Guaranteed.	8.00		.50		20.00			
	{ Found.....	8.00	.00	.57	.07	19.10	— .90		

## ULATION

Protein, Per Cent	Fat, Per Cent	Fibre, Per Cent
8.00	.50	20.00
8.94	1.00	19.10
8.00	.50	20.00
7.25	.57	17.18
-----	-----	-----
.94 — .25	.50 -----	----- -2.53
.63 — .25	.07 -----	----- —.90
-----	-----	-----
5 or 100 per cent.	5 or 100 per cent.	4 or 80 per cent.
1 or 80 per cent.	-----	4 or 100 per cent.
5	5	5

guaranteed.

## ANALYSES OF

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price
6528	Rice Meal.....	Levy Rice Milling Co., New Orleans, La.	Sent by the company.....	Dec. —, '13	.....	.....
6527	Rice Polish.....	..do.....	..do.....	Dec. —, '13	.....	.....
6529	Rice Bran.....	..do.....	..do.....	Dec. —, '13	.....	.....

## RECAPIT

	Guaranteed and Found
Maximum.....	{ Guaranteed..... Found.....
Minimum.....	{ Guaranteed..... Found.....
Deficient.....	{ .....

Note that "deficient" in fiber means better than

## ANALYSES OF POULTRY

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price
6571	Rawleigh's Stock Tonic...	W. T. Rawleigh Medical Co., Freeport, Ill.	Sent by R. C. Morefield, Harmony.	Apr. —, '14	.....	.....
6572	Federal Stock Food.....	Federal Stock Food Co., Mifflinburg, Pa.	Sent by J. R. Bell, Morehead City.	May —, '14	.....	.....
6573	Federal Poultry Food.....	..do.....	..do.....	May —, '14	.....	.....
6551	Chicken Builder and Pul- let Egg Developer.	Anglo-American Poultry Syndicate of London, England; Branches:— New York and Chicago.	Sent by J. M. Stephens & Co., Durham.	Feb. —, '14	.....	.....

\*Largely sulphur.

Note: No. 6551 is unlicensed in this State; was being sold by a house-to-house peddler, who was arrested per cent.)

## RICE PRODUCTS

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
6528	{ Guaranteed	11.00		8.00		11.00			
	{ Found.....	12.50	2.50	12.65	4.65	9.09	-1.91		
6527	{ Guaranteed	11.50		7.00		6.30			
	{ Found.....	11.37	-.13	10.21	3.21	1.95	-4.35		
6529	{ Guaranteed	11.50		12.00		12.00			
	{ Found.....	11.88	+.38	14.04	2.04	8.88	-3.12		

## ULATION

Protein, Per Cent	Fat, Per Cent	Fibre, Per Cent
11.50	12.00	12.00
12.50	14.04	9.09
11.00	7.00	6.30
11.37	10.21	1.95
1 or 33 per cent.		3 or 100 per cent.

guaranteed.

## AND STOCK TONICS

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
6571	{ Guaranteed								
	{ Found.....	11.06		*5.53		10.75			
6572	{ Guaranteed	13.56		3.75		25.46			
	{ Found.....	10.25		*2.92		23.55			
6573	{ Guaranteed	10.75		2.36		10.67			
	{ Found.....	10.58		3.07		10.82			
6551	{ Guaranteed								
	{ Found.....	11.50		1.40					

and punished. The stuff consisted mainly of flour (about 70 to 75) and of charcoal or lamp black (25 to 30

## ANALYSES OF WHOLE WHEAT, OATS,

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price
6583	Whole Wheat.....	Iredell Test Farm.....	Sent by B. W. Kilgore, Raleigh.	July —, '14	-----	-----
6509	Whole Wheat (unscreened)	Alpine Milling Co., Glen Alpine, N. C.	Sent by the company.....	Sept. —, '13	-----	-----
6577	Wheat Screenings.....	-----	Sent by North State Mill- ing Co., Greensboro.	May —, '14	-----	-----
6557	Clean Screenings (ground)	-----	Sent by J. D. Anderson, Tobaccoville.	Mar. —, '14	-----	-----
6543	Floor Sweepings.....	New Bern, Hay Grain & Feed Co., New Bern, N. C.	Sent by the company.....	Jan. —, '14	-----	-----
24	Pure Crushed Oats.....	Lewis & Adcock, Knox- ville, Tenn.	Jones & Hedgecock, Wins- ton-Salem.	July 10, '13	-----	-----

## WHEAT SCREENINGS, FLOOR SWEEPINGS

Laboratory Number	Guaranteed and Found	Protein Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed	Chemist's Finding
6583	{ Guaranteed.....	-----	-----	-----	-----	-----	-----		
	{ Found.....	13.38		1.94		2.10			
6509	{ Guaranteed.....	-----	-----	-----	-----	-----	-----		
	{ Found.....	12.62		2.62		4.28			Unscreened inferior wheat, containing con- siderable amount of weed stems.
6577	{ Guaranteed.....	-----	-----	-----	-----	-----	-----		
	{ Found.....	13.42		2.69		4.70			
6557	{ Guaranteed.....	-----	-----	-----	-----	-----	-----		
	{ Found.....	13.91		3.57		2.58			
6543	{ Guaranteed.....	-----	-----	-----	-----	-----	-----		Small amount of corn bran, but mainly wheat products.
	{ Found.....	9.75		4.14		9.88			
24	{ Guaranteed.....	11.80		5.00		9.50			
	{ Found.....	12.25		3.90		9.06			Corn, oats, cracked corn, outer portion of corn cob, dust, grit.







**THE BULLETIN**

OF THE

**NORTH CAROLINA**

**DEPARTMENT OF AGRICULTURE,**

**RALEIGH**

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Vol. 35, No. 11.

NOVEMBER, 1914.

Whole No. 202.

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- I. ANALYSES OF FERTILIZERS { FALL SEASON, 1913.  
SPRING SEASON, 1914.
- II. ANALYSES OF COTTON-SEED MEAL.

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\*Assigned by the Bureau of Soils, United States Department of Agriculture.

†Assigned by the Bureau of Animal Husbandry, United States Department of Agriculture.

‡In coöperation with Bureau of Plant Industry, United States Department of Agriculture.

HON. W. A. GRAHAM,

*Commissioner of Agriculture.*

SIR:—I submit herewith analyses of fertilizers and cotton-seed meal made in the laboratory of samples collected during the past fall and spring. These analyses show fertilizers and meals to be about as heretofore, and to be, generally, what was claimed for them. I recommend that it be issued as the November BULLETIN.

Very respectfully,

B. W. KILGORE,

*State Chemist.*

Approved for printing:

W. A. GRAHAM,

*Commissioner.*



# I. ANALYSES OF FERTILIZERS, FALL SEASON, 1913; SPRING SEASON, 1914.

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By B. W. KILGORE,  
W. G. HAYWOOD, J. Q. JACKSON, E. S. DEWAR, AND J. R. MULLEN.

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The analyses presented in this BULLETIN are of samples collected by the fertilizer inspectors of the Department, under the direction of the Commissioner of Agriculture, during fall months of 1913 and the spring months of 1914. They should receive the careful study of every farmer in the State who uses fertilizers, as by comparing the analyses in the BULLETIN with the claims made for the fertilizers actually used, the farmer can know by or before the time fertilizers are put in the ground whether or not they contain the fertilizing constituents in the amounts they were claimed to be present.

## TERMS USED IN ANALYSES.

*Water-soluble Phosphoric Acid.*—Phosphate rock, as dug from the mines, mainly in South Carolina, Florida, and Tennessee, is the chief source of phosphoric acid in fertilizers.

In its raw, or natural, state the phosphate has three parts of lime united to the phosphoric acid (called by chemists tricalcium phosphate). This is very insoluble in water and is not in condition to be taken up readily by plants. In order to render it soluble in water and fit for plant food, the rock is finely ground and treated with sulphuric acid, which acts upon it in such a way as to take from the three-lime phosphate two parts of its lime, thus leaving only one part of lime united to the phosphoric acid. This one-lime phosphate is what is known as water-soluble phosphoric acid.

*Reverted Phosphoric Acid.*—On long standing some of this water-soluble phosphoric acid has a tendency to take lime from other substances in contact with it, and to become somewhat less soluble. This latter is known as reverted or gone-back phosphoric acid. This is thought to contain two parts of lime in combination with the phosphoric acid, and is thus an intermediate product between water-soluble and the original rock.

Water-soluble phosphoric acid is considered somewhat more valuable than reverted, because it becomes better distributed in the soil as a consequence of its solubility in water.

*Available Phosphoric Acid* is made up of the water-soluble and reverted; it is the sum of these two.

*Water Soluble Ammonia.*—The main materials furnishing ammonia in fertilizers are nitrate of soda, sulphate of ammonia, cotton-seed meal,

dried blood, tankage, and fish scrap. The first two of these (nitrate of soda and sulphate of ammonia) are easily soluble in water and become well distributed in the soil where plant roots can get at them. They are, especially the nitrate of soda, ready to be taken up by plants, and are therefore quick-acting forms of ammonia. It is mainly the ammonia from nitrate of soda and sulphate of ammonia that will be designated under the heading of water-soluble ammonia.

*Organic Ammonia.*—The ammonia in cotton-seed meal, dried blood, tankage, fish scrap, and so on, is included under this heading. These materials are insoluble in water, and before they can feed plants they must decay and have their ammonia changed, by the aid of the bacteria of the soil, to nitrates, similar to nitrate of soda.

They are valuable then as plant food in proportion to their content of ammonia, and the rapidity with which they decay in the soil, or rather the rate of decay, will determine the quickness of their action as fertilizers. With short season, quick-growing crops, quickness of action is an important consideration, but with crops occupying the land during the greater portion, or all, of the growing season, it is better to have a fertilizer that will become available more slowly, so as to feed the plant till maturity. Cotton-seed meal and dried blood decompose fairly rapidly, but will last the greater portion, if not all, of the growing season in this State. While cotton seed and tankage will last longer than meal and blood, none of these act so quickly, or give out so soon, as nitrate of soda and sulphate of ammonia.

*Total Ammonia* is made up of the water-soluble and organic; it is the sum of these two.

The farmer should suit, as far as possible, the kind of ammonia to his different crops, and a study of the forms of ammonia as given in the tables of analyses will help him to do this.

#### FORM OF POTASH IN TOBACCO FERTILIZERS.

Tobacco growers are becoming yearly more disposed to know the form of potash, whether from kainit, muriate, or sulphate, which enters into their tobacco fertilizers. Considerable work of this kind has been done for individuals, and we now determine the form of potash in all tobacco brands, for the benefit of tobacco growers.

The term potash from muriate, as reported in the analyses, does not mean, necessarily, that the potash was supplied by muriate of potash. Sulphate or some other potash salt may have been used, but in all fertilizers where the term potash from muriate is used, there is enough chlorine present to combine with all the potash, though it may have come from salt in tankage, kainit, or karnalite. As the objection to the use of muriate of potash in tobacco fertilizers arises from the chlorine present, it does not matter whether this substance is present in common salt or potash-furnishing materials.

The use of sulphate of potash where there is chlorine present in the other ingredients of the fertilizer will not prevent the injurious effect of the chlorine. The term potash from muriate in our analyses, therefore, means that there is sufficient chlorine present in the fertilizer from all sources to combine with the potash to the extent indicated by the analyses.

## VALUATIONS.

To have a basis for comparing the values of different fertilizer materials and fertilizers, it is necessary to assign prices to the three valuable constituents of fertilizers—ammonia, phosphoric acid, and potash. These figures, expressing relative value per ton, are not intended to represent crop-producing power, or agricultural value, but are estimates of the commercial value of ammonia, phosphoric acid and potash in the materials supplying them. These values are only approximate, as the cost of fertilizing materials is liable to change as other commercial products are, but they are believed to fairly represent the cost of making and putting fertilizers on the market. They are based on a careful examination of trade conditions, wholesale and retail, and upon quotations of manufacture.

*Relative value per ton*, or the figures showing this, represents the prices on board the cars at the factory, in retail lots of five tons or less, for cash.

To make a complete fertilizer the factories have to mix together in proper proportions materials containing ammonia, phosphoric acid, and potash. This costs something. For this reason it is thought well to have two sets of valuations—one for the raw or unmixed materials, such as acid phosphate, kainit, cotton-seed meal, etc., and one for mixed fertilizers.

The values used last season were:

## VALUATIONS FOR 1913.

*In Unmixed or Raw Materials.*

For phosphoric acid in acid phosphate-----	4	cents per pound.
For phosphoric acid in bone meal and Peruvian Guano.	3½	cents per pound.
For phosphoric acid in basic slag-----	4	cents per pound.
For nitrogen -----	19½	cents per pound.
For potash -----	4	cents per pound.

*In Mixed Fertilizers.*

For phosphoric acid -----	4½	cents per pound.
For nitrogen -----	21	cents per pound.
For potash -----	5	cents per pound.

## VALUATIONS FOR 1914.

*In Unmixed or Raw Materials.*

For phosphoric acid in acid phosphate-----	4	cents per pound.
For phosphoric acid in bone meal and Peruvian Guano and basic slag-----	4	cents per pound.
For nitrogen -----	19½	cents per pound.
For potash -----	4	cents per pound.

*In Mixed Fertilizers.*

For phosphoric acid -----	4½	cents per pound.
For nitrogen -----	21	cents per pound.
For potash -----	5	cents per pound.

## HOW RELATIVE VALUE IS CALCULATED.

In the calculation of relative value it is only necessary to remember that so many per cent means the same number of pounds per hundred, and that there are twenty hundred pounds in one ton (2,000 pounds).

With an 8-2-1.65 goods, which means that the fertilizer contains available phosphoric acid 8 per cent, potash 2 per cent, and nitrogen 1.65 per cent, the calculation is made as follows:

<i>Percentage or Lbs. in 100 Lbs.</i>	<i>Value Per 100 Lbs.</i>	<i>Value Per Ton, 2,000 Lbs.</i>
8 pounds available phosphoric acid at 4½ cents---	0.36 × 20 =	\$ 7.20
2 pounds potash at 5 cents-----	0.10 × 20 =	2.00
1.65 pounds nitrogen at 21 cents-----	0.347 × 20 =	6.94
Total value -----	0.817 × 20 =	\$16.14

Freight and merchant's commission must be added to these prices.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.						Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	
MIXED FERTILIZERS.										
Brands claiming.				8.00	---	---	.82	1.00	3.00	\$ 13.64
3334	Armour Fertilizer Works, Greensboro, N. C.	Armour's 8-1-3 Fertilizer.	Crouse	8.36	.11	.52	.63	.77	2.96	13.13
3364	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Comet Guano.	Esther	8.52	.23	.62	.85	1.03	3.56	14.80
3373	Va.-Car. Chemical Co., Richmond, Va.	Harvester.	Seagrove	9.92	.65	.34	.99	1.20	3.18	16.27
---	do.	McCormick's Wheat and Grain Guano.	North Wilkesboro	8.42	.95	.22	1.17	1.42	3.02	15.51
Brands claiming.				8.00	---	---	.82	1.00	4.00	14.64
3415	American Agricultural Chemical Co., New York, N. Y.	Fidelity Grain Grower.	Landis	9.71	.57	.20	.77	.94	3.80	15.77
3070	do.	do.	Davidson.	8.85	.93	.30	1.23	1.50	2.38	15.51
3277	Bryant Fertilizer Co., Alexandria, Va.	Bryant's Special Formula for Grain and Grass.	Burlington.	8.64	.37	.18	.55	.66	4.34	14.43
3106	Carolina Warehouse Co., Salisbury, N. C.	Farmers' Union 8-1-4.	Greensboro.	7.86	.63	.22	.85	1.03	3.68	14.32
3454	Georgia Chemical Co., Augusta, Ga.	Buyers Special Mixture.	Durham.	8.27	.57	.24	.81	.98	4.28	15.12
3316	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Farmers' Favorite.	Burlington.	8.07	.13	.68	.81	.98	3.48	14.48
3105	United States Fertilizer Co., Baltimore, Md.	Farm Bell Pennant Winner.	Greensboro.	8.53	.35	.40	.75	.91	4.02	14.85
Brand claiming.				8.00	---	---	.82	1.00	5.00	15.64
3398	Union Guano Co., Winston, N. C.	Special Mixture.	Ararat.	8.85	.21	.40	.61	.74	4.84	15.37
Brand claiming.				8.00	---	---	.82	1.00	6.00	16.64
3104	United States Fertilizer Co., Baltimore, Md.	Farm Bell Wheat, Oat and Corn Special.	Greensboro.	8.72	.33	.52	.85	1.03	5.96	17.38

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.						Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	
MIXED FERTILIZERS.										
Brands claiming										
3245	Baugh & Sons Co., Norfolk, Va.	Baugh's Southern States Excelsior	Guilford College	8.00			1.00	1.22	3.00	\$ 14.40
3085	Peachontas Guano Co., Lynchburg, Va.	A. A. Complete Champion Brand	Trinity	7.66	.61	.60	1.21	1.47	4.16	16.14
Brands claiming										
3421	Carolina-Union Fertilizer Co., Norfolk, Va.	Carolina-Union 1.21-8-4	Mount Airy	8.41	.71	.20	.91	1.11	2.52	13.91
3408	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Wheat, Corn, and Peanut Manure.	Wilkesboro	8.00			1.00	1.22	4.00	15.40
Brands claiming										
3335	Acme Manufacturing Co., Wilmington, N. C.	Acme Special Grain Fertilizer	Crouse	8.53	.09	.98	1.07	1.30	3.60	15.76
3363	do	Gem Fertilizer	Candor	8.26	.79	.22	1.01	1.23	4.02	15.70
3443	Adair, A. D., & McCarty Co., Chattanooga, Tenn.	Adair's Ammoniated Dissolved Bone	Clyde	8.00			1.65	2.00	2.00	16.13
3424	American Agricultural Chemical Co., New York, N. Y.	Canton Chemical Co.'s Baker's Fish Guano.	Kings Mountain	8.86	1.65	1.14	1.79	2.18	1.90	17.39
3430	do	Detrick's Fish Manure	Pinnacle	8.12	.49	1.10	1.59	1.93	2.56	16.55
3417	do	Detrick's Royal Crop Grower	Landis	8.31	.99	1.14	2.13	2.59	3.18	19.60
3091	do	Zell's Calvert Guano	Elkin	8.28	1.21	.40	1.61	1.96	2.16	16.37
3154	do	Zell's Fish Guano	Lattimore	8.06	1.05	.50	1.55	1.88	2.00	15.76
3453	American Fertilizer Co., Norfolk, Va.	A. L. Hannah's Special Formula Guano	Reidsville	9.09	1.19	.30	1.49	1.81	1.98	16.42
3156	do	Bone and Phosphate Guano	Monroe	8.31	1.23	.36	1.59	1.93	2.02	16.18
3058	do	do	Esther	8.37	1.17	.34	1.51	1.84	1.94	15.81
				8.90	1.05	.64	1.69	2.05	2.06	17.18
				8.95	.93	.32	1.25	1.52	1.92	15.22
				8.44	.75	.32	1.07	1.30	1.86	13.95

3219	Armour Fertilizer Works, Greensboro, N. C.	Armour's Slaughter House Fertilizer	Gastonia	8.04	.81	.75	1.57	1.91	2.06	15.89
3325	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Complete Fertilizer	Asheville	7.12	.29	1.36	1.65	2.01	2.20	15.54
3406	Atlantic Chemical Co., Norfolk, Va.	Atlantic Special Wheat Fertilizer	Rockford	8.24	.92	.70	1.62	1.97	2.12	16.34
3244	Baugh & Sons Co., Norfolk, Va.	Baugh's Animal Base and Potash Compound	Guilford College	8.19	1.05	.68	1.73	2.10	2.42	17.06
3311	do.	do.	Statesville	8.10	.93	.60	1.53	1.86	2.26	15.98
3131	do.	Baugh's Wheat Fertilizer	Big Lick	8.14	.97	.64	1.61	1.96	1.62	15.71
3397	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Crown Brand Ammoniated Guano	Walnut Cove	7.92	.77	1.06	1.83	2.22	2.20	17.01
3432	Carolina-Union Fertilizer Co., Norfolk, Va.	Carolina-Union 2-8-2	Mount Airy	8.65	.27	1.36	1.63	1.98	2.18	16.81
3108	Carolina Warehouse Co., Salisbury, N. C.	Farmers' Union 8-2-2 Guano	Greensboro	8.27	1.09	.40	1.49	1.81	2.18	15.88
3221	Columbia Guano Co., Norfolk, Va.	Columbia Soluble Guano	Conover	8.04	1.01	.52	1.53	1.86	2.30	15.96
3166	Conestee Chemical Co., Wilmington, N. C.	Conestee Standard Guano	Maiden	8.15	.57	1.22	1.79	2.18	2.10	16.95
3288	Etiwan Fertilizer Co., Charleston, S. C.	Plow Brand Ammoniated Guano	Salisbury	9.45	.87	.66	1.53	1.86	2.04	16.97
3176	Farmers Guano Co., Raleigh, N. C.	State Standard Guano	Gold Hill	7.98	.65	1.18	1.83	2.22	2.92	17.79
3298	Georgia Chemical Works, Augusta, Ga.	Georgia Formula	North Wilkesboro	8.25	1.29	.32	1.61	1.96	2.16	16.35
3067	Imperial Guano Co., Norfolk, Va.	Champion Guano	Davidson	7.99	1.19	.36	1.55	1.88	2.30	16.00
3345	Lee, A. S., & Sons Co., Richmond, Va.	Lee's 8-2-2 Fertilizer	Burlington	7.88	1.45	.42	1.87	2.27	1.82	16.77
3142	Lister's Agricultural Chemical Works, Newark, N. J.	Lister's Success Fertilizer	Rockwell	8.75	1.15	.46	1.61	1.96	2.04	16.68
3337	Hampton Guano Co., Norfolk, Va.	Shirley Superphosphate	Maiden	8.15	1.23	.54	1.77	2.15	2.10	16.87
3187	Marietta Fertilizer Co., Greensboro, N. C.	Marietta Solid South	Reidsville	7.82	.81	.68	1.49	1.81	2.08	15.38
3199	Martin Fertilizer Co., Norfolk, Va.	Martin's Carolina Cotton Grower	Lawndale	8.10	.69	.60	1.29	1.57	2.24	14.95
3289	do.	Martin's Special Grain Grower	Salisbury	8.04	.50	.53	1.03	1.25	2.48	14.04
3255	Miller Fertilizer Co., Baltimore, Md.	Ammoniated Dissolved Bone	Siler City	8.23	.90	.89	1.79	2.18	2.52	17.44
3256	do.	Farmers' Profit	Liberty	7.64	1.05	.72	1.77	2.15	3.06	17.37
3433	Navassa Guano Co., Wilmington, N. C.	Navassa Grain Fertilizer	Pinnacle	8.57	1.19	.26	1.45	1.76	2.20	16.00
3290	Patapsco Guano Co., Baltimore, Md.	Sea Gull Ammoniated Guano	Granite Quarry	9.23	.93	.50	1.43	1.74	2.14	16.45
3456	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Cultivator Guano	Reidsville	8.01	.33	1.38	1.71	2.08	2.10	16.49

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.						Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	
MIXED FERTILIZERS.										
Brands claiming										
3144	Navassa Guano Co., Wilmington, N. C.	Navassa Grain Grower	Rockwell	8.00			1.65	2.00	2.00	\$ 16.13
3315	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Bone and Peruvian Mixture	Burlington	8.77	.53	1.06	1.59	1.93	2.80	17.37
3367	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters' Standard Fertilizer	Wadesboro	8.30	.31	1.22	1.53	1.86	2.40	16.30
3291	Pocahontas Guano Co., Lynchburg, Va.	Carrington's Banner Brand Guano	Gold Hill	8.20	.45	1.34	1.79	2.18	1.70	16.60
3092	do.	do.	Madison	9.55	.46	.91	1.37	1.67	1.98	16.33
3279	Pocomoke Guano Co., Norfolk, Va.	Pamlico Superphosphate	Kernersville	7.78	1.07	.48	1.55	1.88	1.88	15.39
3370	do.	do.	Seagrove	9.04	1.01	.60	1.61	1.96	2.74	17.64
3268	Richmond Guano Co., Richmond, Va.	Premium Brand Fertilizer	Albemarle	7.72	1.25	.34	1.59	1.93	2.00	15.63
3082	Robertson Fertilizer Co., Norfolk, Va.	Double Dollar Soluble Guano	Glenola	8.11	.77	.84	1.61	1.96	2.34	16.40
3242	Royster, F. S., Guano Co., Norfolk, Va.	Farmers' Bone Fertilizer	Kernersville	8.05	.49	.92	1.41	1.71	2.34	15.51
3174	do.	Royster's Special Wheat Fertilizer	Faith	7.10	1.03	.60	1.63	1.98	2.66	15.90
3292	Swift Fertilizer Works, Wilmington, N. C.	Swift's Red Steer	Salisbury	8.24	.56	.93	1.49	1.81	1.98	15.65
3258	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Standard	Siler City	7.09	.49	1.14	1.63	1.98	2.26	15.49
3175	do.	do.	Granite Quarry	8.30	.64	.89	1.53	1.86	1.96	15.86
3254	Union Guano Co., Winston, N. C.	Fish Brand Ammoniated Guano	Siler City	7.98	.75	.68	1.43	1.74	1.98	15.17
3409	do.	do.	Elkin	8.20	1.41	.38	1.79	2.18	1.80	16.70
				8.87	1.15	.30	1.45	1.76	2.26	16.33

3103	---do---	Old Honesty Guano.....	Greensboro.....	8.09	1.43	.38	1.81	2.20	2.00	16.88
3239	United States Fertilizer Co., Baltimore, Md.....	Farm Bell Standard Guano.....	Kernersville.....	8.51	.35	1.10	1.45	1.76	2.80	16.55
3429	Va.-Car. Chemical Co., Richmond, Va.....	A. & A.'s Anchor Brand Fertilizer.....	Dunn.....	9.26	.69	.44	1.13	1.37	2.58	15.66
3152	---do---	Davie & Whittle's Owl Brand Guano.....	Rutherfordton.....	9.32	1.41	.34	1.75	2.13	2.90	18.64
3057	---do---	Old Dominion Farmers' Friend Fertilizer.....	Graves Siding.....	8.33	1.17	.38	1.55	1.88	2.62	16.63
3218	---do---	Old Dominion Soluble Guano.....	Maiden.....	8.47	1.05	.34	1.39	1.69	2.46	15.92
3127	---do---	Southern Chemical Co.'s Electric Standard Guano.....	North Wilkesboro.....	8.07	.99	.50	1.49	1.81	2.04	15.36
3116	---do---	Tinsley & Co.'s Stonewall Guano.....	Winston.....	8.47	1.13	.36	1.49	1.81	1.98	15.86
3089	---do---	Travers & Co.'s Beef Blood and Bone Fertilizer.....	North Wilkesboro.....	8.82	1.19	.20	1.39	1.69	2.48	16.26
3374	---do---	Travers & Co.'s National Fertilizer.....	Seagrove.....	8.14	.89	.46	1.35	1.64	2.18	15.18
3434	---do---	V.-C. Co.'s Plant Food.....	Pilot Mountain.....	7.72	1.07	1.04	2.11	2.57	2.04	17.85
<b>Brand claiming</b>										
3343	Baugh & Sons Co., Norfolk, Va.....	Baugh's Complete Animal Base Fertilizer.....	Burlington.....	8.00	.97	.76	1.65	2.00	5.00	19.13
<b>Brand claiming</b>										
3069	Lister's Agricultural Chemical Works, Newark, N. J.....	Lister's Ammoniated Dissolved Bone Phosphate.....	Concord.....	9.07	1.45	.48	1.93	2.35	2.20	18.47
3286	Patapsco Guano Co., Baltimore, Md.....	Patapsco Guano.....	Mooreville.....	10.34	.44	1.31	1.75	2.13	2.18	18.84
<b>Brands claiming</b>										
3393	Coe-Mortimer Co., Charleston, S. C.....	Coe-Mortimer Co.'s Cotton and Corn Fertilizer.....	Hildebran.....	8.27	.83	.58	2.41	2.93	3.20	20.76
3407	Patapsco Guano Co., Baltimore, Md.....	Unicorn Guano.....	North Wilkesboro.....	8.26	1.43	.52	1.95	2.37	2.84	18.46
3455	Piedmont-Mount Airy Guano Co., Baltimore, Md.....	Piedmont Guano for Tobacco.....	Reidsville.....	8.29	.41	1.52	1.93	2.35	3.21	18.81
3225	Va.-Car. Chemical Co., Richmond, Va.....	Powers, Gibbs & Co.'s Carolina Golden Belt Ammo. Guano for Tobacco.....	Mount Airy.....	9.11	1.41	.34	1.75	2.13	2.64	18.19
<b>Brands claiming</b>										
3446	Acme Mfg. Co., Wilmington, N. C.....	Acme 8-3-3 C. S. M.....	Tabor.....	8.38	.73	1.58	2.31	2.81	3.00	20.57
3446	American Agricultural Chemical Co., New York, N. Y.....	Detrick's Victory Cotton Fertilizer.....	Landis.....	8.04	1.35	.94	2.29	2.78	2.86	19.71
3153	---do---	Zell's Reliance High Grade Manure.....	Lattimore.....	7.84	1.61	.70	2.31	2.81	2.88	19.64
3379	American Fertilizer Co., Norfolk, Va.....	American Eagle Guano.....	Catawba.....	8.59	1.63	.38	2.01	2.44	2.32	18.49

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.						Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	
MIXED FERTILIZERS.										
Brands claiming										
3220	Armour Fertilizer Works, Greensboro, N. C.	Armour's 8-3-3 Fertilizer	Gastonia	8.00	1.21	.82	2.47	3.00	3.00	\$ 20.57
3324	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Complete Fertilizer.	Asheville	5.15	.47	1.88	2.35	2.86	4.00	18.50
3336	Atlantæ Chemical Co., Norfolk, Va.	Atlantæ High Grade Soluble Guano.	Maiden	7.83	.65	1.68	2.33	2.83	3.30	20.13
3418	Baugh & Sons Co., Norfolk, Va.	Baugh's Grand Rapid High Grade Guano.	China Grove	8.03	1.81	.60	2.41	2.23	3.48	20.83
3344	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh Eclipse	Burlington	7.62	1.05	1.32	2.37	2.88	3.24	20.05
3136	Carolina Warehouse Co., Salisbury, N. C.	Farmers' Union Guano	Salisbury	8.22	1.49	1.06	2.55	3.10	3.58	21.69
3177	Farmers Guano Co., Raleigh, N. C.	Money Point Guano	Gold Hill	8.00	.75	1.48	2.23	2.71	3.46	20.01
3260	Georgia Chemical Co., Augusta, Ga.	Intensive Formula	Siler City	9.64	1.47	.44	1.91	2.32	2.58	19.28
3068	Imperial Co., Norfolk, Va.	X. L. O. Cotton Guano	Davidson	8.03	1.55	.52	2.07	2.52	2.74	19.66
3267	Marietta Fertilizer Co., Greensboro, N. C.	Marietta Pride of Piedmont	Albemarle	8.62	.99	1.00	1.99	2.42	2.94	19.06
3448	Navassa Guano Co., Wilmington, N. C.	Navassa High Grade Guano	Tabor	9.00	1.51	.58	2.09	2.54	2.64	19.52
3188	Old Buck Guano Co., Richmond, Va.	Old Buck Quincey Tobacco and Garden Fertilizer.	Roxboro	7.28	.69	1.60	2.29	2.78	3.60	19.77
3285	Patapseo Guano Co., Baltimore, Md.	Choctaw Guano	Moorestville	8.02	.42	1.37	1.79	2.18	3.02	17.76
3365	Planters Fertilizer Co., Charleston, S. C.	Planters Soluble Guano	Wadesboro	9.12	.57	1.62	2.19	2.66	3.10	20.51
3165	Royster, F. S., Guano Co., Norfolk, Va.	Marlboro High Grade Cotton Grower	Newton	8.45	1.31	.84	2.15	2.61	3.22	19.85
3252	Swift Fertilizer Works, Wilmington, N. C.	Swift's Ruralist High Grade Guano	Burgaw	7.75	.59	2.08	2.67	3.25	4.02	22.21

3217	Union Guano Co., Winston, N. C.	Union Homestead Guano.	Hickory	9.82	1.35	.34	1.69	2.05	2.40	18.34
3197	Venable Fertilizer Co., Richmond, Va.	Ballard's Choice Fertilizer	Kings Mountain	7.91	1.11	1.20	2.31	2.81	3.59	20.41
3332	Va.-Car. Chemical Co., Richmond, Va.	Norfolk and Carolina Chemical Co.'s Amazon High Grade Guano.	Mount Olive	9.64	1.71	.66	2.37	2.88	3.16	21.79
3451	-----do-----	Old Dominion Guano Co.'s Farmers' Friend Special	Chadborn	8.73	1.23	.58	1.81	2.20	3.54	19.00
3185	-----do-----	V.-C. C. Co.'s Gold Medal High Grade Tobacco Guano.	Durham	8.77	.97	1.38	2.35	2.86	2.64	20.40
3439	-----do-----	V.-C. C. Co.'s Royal High Grade Fertilizer.	Raleigh	9.00	1.81	.36	2.17	2.64	3.08	20.27
	<b>Brand claiming</b>			8.00			2.47	3.00	10.00	27.57
3253	Swift Fertilizer Works, Wilmington, N. C.	Swift's Strawberry Grower, High Grade	Wilmington	6.39	.45	2.14	2.59	3.15	10.42	27.05
	<b>Brands claiming</b>			8.00			3.29	4.00	4.00	25.02
3331	Acme Fertilizer Works, Wilmington, N. C.	Acme O. K. Fertilizer	Mount Olive	8.60	1.53	1.36	2.89	3.51	4.36	24.22
3205	Armour Fertilizer Works, Greensboro, N. C.	Armour's No. 844 Fertilizer	Denton	8.17	1.75	1.06	2.81	3.42	4.86	24.01
3302	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union 8-4-4 Guano	Salisbury	8.36	2.17	.70	2.87	3.49	4.24	23.82
3447	Navassa Guano Co., Wilmington, N. C.	Navassa Special Truck Guano	Tabor	9.34	2.33	.54	2.87	3.49	3.34	23.80
2427	Pearsall & Co., Wilmington, N. C.	Pearsall's Fish and Potash Compound Guano	Wallace	7.15	1.15	2.12	3.27	3.98	3.84	24.01
3366	Planters Phosphate and Fertilizer Co., Charleston, S. C.	Planters' Special Cotton Fertilizer	Wadesboro	8.67	1.39	1.60	2.99	3.64	4.18	24.54
3102	Union Guano Co., Winston, N. C.	Union Premium Guano	Greensboro	9.41	2.29	.32	2.61	3.17	2.64	22.07
3430	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Durham High Grade	Chadborn	8.12	2.35	.84	3.19	3.88	4.12	24.77
3428	-----do-----	V.-C. C. Co.'s Special	Wallace	8.94	2.03	.42	2.45	2.98	3.84	22.18
	<b>Brand claiming</b>			8.00			4.11	5.00	7.00	31.46
3109	Armour Fertilizer Works, Greensboro, N. C.	Blood, Bone, and Potash Fertilizer	Greensboro	7.80	2.55	1.96	2.51	3.05	6.50	28.26
	<b>Brand claiming</b>			8.50			2.26	2.75	2.00	19.14
3186	Va.-Car. Chemical Co., Richmond, Va.	A. & A.'s Anchor Brand Fertilizer	Durham	8.94	.30	1.89	2.19	2.26	2.08	19.32
	<b>Brands claiming</b>			9.00			.82	1.00	2.00	13.54
3189	American Fertilizer Co., Norfolk, Va.	American Bone Mixture	Reidsville	9.07	.55	.28	.83	1.01	2.18	13.83
3259	Baugh & Sons Co., Norfolk, Va.	Baugh's Grain and Grass Grower	Liberty	9.29	.47	.32	.79	.96	2.68	14.36
3241	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Special	Kernersville	9.87	.45	.40	.85	1.03	2.34	14.79

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.						Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	
MIXED FERTILIZERS.										
Brand claiming.....				9.00	-----	-----	.82	1.00	2.00	\$ 13.54
3317 Va.-Car. Chemical Co., Richmond, Va.....		V-C. Co.'s Baltimore Special Mixture.	Hillsboro.....	9.56	.56	.45	1.01	1.23	2.22	15.15
Brands claiming.....				9.00	-----	-----	.82	1.00	3.00	14.54
3425 American Agricultural Chemical Co., New York, N. Y.....		Mogul Fertilizer.....	Moorestville.....	9.67	.57	.20	.77	.94	3.46	15.40
3246 Armour Fertilizer Works, Greensboro, N. C.....		Armour's No. 193 Fertilizer.....	Winston.....	9.17	.71	.46	1.17	1.42	2.72	15.89
3310 Baugh & Sons Co., Norfolk, Va.....		Baugh's Grain and Grass Grower.....	Statesville.....	8.80	.47	.36	.83	1.01	2.22	13.63
3226 Martin Fertilizer Co., Norfolk, Va.....		Martin's Dissolved Organic Compound.....	Pilot Mountain.....	9.37	.27	.56	.83	1.01	2.48	14.40
do.....		Martin's Special Grain Grower.....	Lawndale.....	9.02	.29	.50	.79	.96	3.54	14.98
3198 Navassa Guano Co., Wilmington, N. C.....		Long's Wheat and Grass Guano.....	Rockwell.....	8.79	.21	.68	.89	1.08	3.28	14.93
3143 Patapasco Guano Co., Baltimore, Md.....		Coon Brand Guano.....	North Wilkesboro.....	8.86	.39	.64	1.03	1.25	3.06	15.36
3128 Powhatan Chemical Co., Richmond, Va.....		Powhatan Grain Guano.....	Charlotte.....	9.10	.45	.30	.75	.91	3.58	14.92
3380 Royster, F. S., Guano Co., Norfolk, Va.....		Royster's Grain Guano.....	Winston-Salem.....	9.00	.53	.40	.93	1.13	3.08	15.09
3243 Tuscarora Fertilizer Co., Greensboro, N. C.....		Tuscarora Fertilizer No. 913.....	Siler City.....	9.42	.52	.25	.77	.94	3.02	14.73
3257 Union Guano Co., Winston, N. C.....		B. S. Grain Ammoniated Guano.....	Lawndale.....	9.49	.41	.18	.59	.72	3.30	14.32
3196 Va.-Car. Chemical Co., Richmond, Va.....		A. & A.'s Little Giant Grain and Grass Grower.....	Mocksville.....	8.13	.57	.16	.73	.89	2.72	13.10
3280 do.....		Bernhardt's Grain and Crop Guano.....	Walnut Cove.....	8.35	.75	.28	1.03	1.25	3.40	15.24
3435 do.....		Bigelow's Crop Grower.....	Trinity.....	9.44	.33	.52	.85	1.03	2.98	15.05
3084 do.....										

Brand claiming				9.00		1.00	1.22	2.00	14.30
3394	Robertson Fertilizer Co., Norfolk, Va.	Robertson's Blood and Bone Mixture	Shelby	9.24	.53	.91	1.11	1.98	14.12
Brand claiming				9.00		1.65	2.00	1.00	16.03
3383	Va.-Car. Chemical Co., Richmond, Va.	A. & A.'s Star Brand Guano	Lenoir	10.44	.61	.79	.96	2.12	14.83
Brand claiming				9.00		1.65	2.00	2.00	17.03
3392	Coe-Mortimer Co., Charleston, S.C.	Knickerbocker Standard	Hildebran	8.59	1.27	1.59	1.93	2.08	16.49
Brands claiming				9.00		1.65	2.00	3.00	18.03
3314	Armour Fertilizer Works, Greensboro, N. C.	Armour's Bone and Dissolved Bone with Potash	Burlington	8.82	.71	1.39	1.69	3.42	17.20
3107	Carolina Warehouse Co., Salisbury, N. C.	Farmers' Union 9-2-3 Guano	Greensboro	11.84	1.25	1.57	1.91	3.62	20.87
3419	Powhatan Chemical Co., Richmond, Va.	North Carolina Favorite	Lawdale	9.06	.87	1.63	1.98	3.62	18.62
3387	Union Guano Co., Winston, N. C.	Farmers Blood and Bone Guano	Cornelius	9.47	1.03	1.27	1.54	2.52	16.38
Brand claiming				9.00		1.85	1.25	1.00	16.87
3155	Bradley Fertilizer Co., Boston, Mass.	Standard Seafowl Guano	Charlotte	10.05	1.09	1.83	2.22	1.40	18.13
Brand claiming				9.00		1.85	2.25	4.00	19.87
3278	Pocomoke Guano Co., Norfolk, Va.	Monticello Animal Bone Fertilizer	Kernersville	9.14	1.19	1.69	2.05	3.96	19.28
Brand claiming				9.00		2.47	3.00	2.00	20.47
3441	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s L. and M. Special	Raleigh	9.73	2.19	2.43	2.95	1.80	20.76
Brands claiming				10.00		.82	1.00	3.00	15.44
3444	Royster, F. S., Guano Co., Norfolk, Va.	Haywood County Special Guano	Waynesville	10.12	.21	.42	.77	4.20	15.95
3381	Swift Fertilizer Works, Wilmington, N. C.	Swift's Planters' Special Standard	Newton	9.21	.35	.46	.98	3.52	15.21
Brand claiming				10.00		1.03	1.25	2.00	15.33
3461	Farmers Guano Co., Norfolk, Va.	Farmers' Grain Grower	Mount Airy	10.79	.51	.97	1.18	2.40	16.18
Brands claiming				10.00		1.03	1.25	6.00	19.33
3247	Carolina Warehouse Co., Salisbury, N. C.	Farmers' Union 10-1.25-6 Guano	Winston-Salem	11.19	.75	.87	1.06	5.42	19.15
3163	Union Guano Co., Winston, N. C.	Grain Chemical	Conover	10.41	.77	.85	1.03	5.58	18.52

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.						Relative Value per Ton at Factory.	
				Available Phosphate Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.		
MIXED FERTILIZERS.											
Brand claiming				10.00				1.65	2.00	5.00	\$ 20.93
33440	Va.-Car. Chemical Co., Richmond, Va.....	V.-C. Co.'s Special Grain Mixture.....	Raleigh.....	10.60	1.49	.22		1.71	2.08	4.24	20.96
Brands claiming				10.00				3.29	4.00	4.00	26.82
33414	Armour Fertilizer Works, Greensboro, N. C.....	Armour's 10-4-4 Fertilizer.....	China Grove.....	9.79	1.19	1.72		2.91	3.54	4.84	25.87
33395	Va.-Car. Chemical Co., Richmond, Va.....	V.-C. Co.'s Electric High Grade Special Guano.....	Morganton.....	10.30	2.73	.16		2.89	3.51	3.98	25.39
Brand claiming				10.00				3.29	4.00	5.00	27.82
33386	Armour Fertilizer Works, Greensboro, N. C.....	Armour's 10-4-5 Fertilizer.....	Taylorsville.....	9.14	1.23	1.78		3.01	3.66	5.58	26.45
Brand claiming				6.00				1.65	2.00	5.00	17.33
32940	Royster, F. S., Guano Co., Norfolk, Va.....	Royster's 2-6-5 Special.....	Kernersville.....	5.81	.85	.74		1.59	1.93	5.02	16.93
Brands claiming				6.00				4.11	5.00	7.00	29.66
33330	Armour Fertilizer Works, Greensboro, N. C.....	Armour's 5 Per Cent Trucker.....	Wilmington.....	5.80	2.39	1.30		3.69	4.49	6.86	27.58
33449	Va.-Car. Chemical Co., Richmond, Va.....	V.-C. Co.'s Special Truck Guano.....	Chadbourne.....	7.12	2.99	.70		3.69	4.49	8.16	30.07
Brands claiming				8.00						4.00	11.20
33369	Acme Mfg. Co., Wilmington, N. C.....	Acme Bone and Potash.....	Candor.....	8.80						3.08	11.00
30994	American Agricultural Chemical Co., New York, N. Y.....	Palmetto Alkaline Phosphate.....	Elkin.....	8.98						3.90	11.98
31577	American Fertilizer Co., Norfolk, Va.....	American Special Potash Mixture for Wheat.....	Moore.....	7.77						4.70	11.68
31445	Armour Fertilizer Works, Greensboro, N. C.....	Armour's Phosphate and Potash.....	Albemarle.....	8.31						3.42	10.90

3360	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Special Bone and Potash.	Asheville	10.42	2.50	11.88
3410	Atlantic Chemical Co., Norfolk, Va.	Atlantic 8-4 Bone and Potash Mixture	Raeford	7.83	3.46	10.51
3347	Bryant Fertilizer Co., Alexandria, Va.	Bryant's Wheat Grower	Burlington	8.27	5.18	12.62
3117	Carolina Warehouse Co., Salisbury, N. C.	Farmers' Union 8-4 Bone and Potash	Winston	9.32	3.00	11.39
3179	Farmers Guano Co., Raleigh, N. C.	Special Bone and Potash Mixture	Gold Hill	10.28	3.94	13.19
3209	Georgia Chemical Works, Augusta, Ga.	Acid Phosphate with 4 Per Cent Potash	Denton	8.48	3.72	11.35
3060	Imperial Co., Norfolk, Va.	Yadkin Wheat Grower	Ether	7.90	3.92	11.02
3282	do.	do.	Burlington	8.16	3.72	11.06
3222	Marietta Fertilizer Co., Greensboro, N. C.	Marietta Golden Grain Grower	Mount Airy	8.36	4.02	11.54
3401	Powhatan Chemical Co., Richmond, Va.	Powhatan Bone and Potash Mixture	Mount Airy	9.47	3.84	12.36
3074	Royster, F. S., Guano Co., Norfolk, Va.	Royster's 8-4 Bone and Potash Mixture	Charlotte	8.76	4.00	11.88
3375	Swift Fertilizer Works, Atlanta, Ga.	Swift's Plantation Standard Grade Phosphate and Potash.	Trinity	7.99	4.06	11.25
3112	United States Fertilizer Co., Baltimore, Md.	Farm Bell Wheat and Grass Grower	Greensboro	8.51	5.42	13.08
3139	Union Guano Co., Winston, N. C.	Union Wheat Mixture	Richfield	9.85	4.00	12.86
3079	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Carr's Special Wheat Grower.	Trinity	8.82	4.16	12.10
3081	do.	Southern Chemical Co.'s Click's Special Newsum.	Newsum	9.71	4.40	13.14
3158	do.	Wheat Compound.	Iron Station	7.42	4.50	11.18
3097	do.	S. W. Travers & Co.'s Special Wheat Compound.	North Wilkesboro	10.92	3.46	13.29
	Brand claiming	Va. State Fert. Co.'s Gilt Edge Brand Dissolved Bone and Potash.		8.00	5.00	12.20
3350	United States Fertilizer Co., Baltimore, Md.	Farm Bell Phosphate and Potash	Effland	8.98	5.16	13.24
	Brand claiming			9.00	3.00	11.10
3351	Armour Fertilizer Works, Greensboro, N. C.	Armour's Phosphate and Potash Fertilizer.	Burlington	9.72	2.94	11.69
	Brands claiming			10.00	2.00	11.00
3095	American Agricultural Chemical Co., New York, N. Y.	Zell's Bone and Potash	Elkin	11.82	1.84	12.48
3194	American Fertilizing Co., Norfolk, Va.	Dissolved Bone and Potash for Corn and Wheat.	Reidsville	9.85	2.06	10.86
3072	Armour Fertilizer Works, Greensboro, N. C.	Armour's Phosphate and Potash Fertilizer.	Concord	9.94	1.60	10.55

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.					Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.		Potash.
MIXED FERTILIZERS.										
Brands claiming										
3361	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Special XXX	Asheville.	10.00					2.00	\$ 11.00
3359	Atlantic Fertilizer Co., Atlanta, Ga.	Wheat Grower.		10.99					2.44	12.33
3059	Baugh & Sons Co., Norfolk, Va.	Atlantic Acid Potash Mixture 10-2 Standard Grade.	Hendersonville.	9.68					2.98	11.69
3327	Beta Fertilizer Co., Beta, N. C.	Baugh's Soluble Alkaline Superphosphate.	Randleman.	10.07					2.78	11.84
3281	Bryant Fertilizer Co., Alexandria, Va.	Beta Special Grass and Grain Fertilizer.	Sylva.	10.60					1.44	10.98
3303	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Bryant's Bone and Potash.	Burlington.	10.29					1.84	11.10
3248	Carolina Warehouse Co., Salisbury, N. C.	Caraleigh Electric Bone and Potash Mixture.	Troy.	9.94					2.30	11.25
3167	Conestee Chemical Co., Wilmington, N. C.	Farmers' Union 10-2 Bone and Potash.	Winston-Salem.	10.61					2.42	11.97
3178	Farmers Guano Co., Raleigh, N. C.	Conestee Bone and Potash.	Maiden.	10.88					2.26	12.05
3208	Georgia Chemical Works, Augusta, Ga.	Century Bone and Potash Mixture.	Gold Hill.	10.02					2.06	11.08
3338	Hampton Guano Co., Norfolk, Va.	Bone and Potash.	Denton.	9.84					1.96	10.62
3073	Imperial Co., Norfolk, Va.	Dauntless Potash Mixture.	Maiden.	10.90					2.06	11.87
3377	.....do.....	Virginia Grain Mixture.	Davidson.	10.70					2.18	11.81
3159	Lee, A. S., & Sons Co., Richmond, Va.	.....do.....	Seagrove.	10.37					2.00	11.33
3147	Lister's Agricultural Chemical Works, Newark, N. J.	Lee's Wheat Fertilizer.	Waco.	10.07					1.90	10.96
3272	Marietta Fertilizer Co., Greensboro, N. C.	Lister's Phosphoric Acid and Potash.	Rockwell.	10.91					3.86	13.68
		Marietta Dissolved Bone and Potash.	Albemarle.	10.08					1.96	11.03

3293	Patapasco Guano Co., Baltimore, Md.	Patapasco Soluble Phosphate and Potash.	Granite Quarry.	10.37	2.24	11.57
3118	Pocalontas Guano Co., Lynnhburg, Va.	Carrington's Superior Grain Compound	Madison	12.07	2.18	13.04
3389	Pocomoke Guano Co., Norfolk, Va.	10-2 Potash Mixture	Statesville	10.49	2.36	11.80
3227	Powhatan Chemical Co., Richmond, Va.	Bone and Potash Mixture	Mount Airy	10.02	2.00	11.02
3200	Navassa Guano Co., Wilmington, N. C.	Dissolved Bone with Potash	Lawdale	10.03	1.96	10.99
3399	Robertson Fertilizer Co., Norfolk, Va.	Level Run Dissolved Bone	Mocksville	9.17	2.08	10.33
3131	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Bone and Potash Mixture	North Wilkesboro	10.69	1.34	10.96
3306	Swift Fertilizer Works, Atlanta, Ga.	Swift's Wheat Grower Standard Grade Phosphate and Potash.	Troy	9.53	2.04	10.62
3207	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Bone and Potash	Denton	9.96	2.06	11.02
3137	do	do	Big Lick	10.35	1.66	10.97
3349	United States Fertilizer Co., Baltimore, Md.	Farm Bell Alkaline Mixture	Erfland	10.31	2.66	11.94
3183	Union Guano Co., Winston, N. C.	Union 10-2 Bone and Potash	Norwood	10.32	2.62	11.90
3234	Va-Car. Chemical Co., Richmond, Va.	A. & A.'s McGavock's Special Potash Mixture	Mount Airy	10.40	2.28	11.64
3373	do	A. & A.'s B. P. Potash Mixture	Lexington	10.11	1.86	10.96
3129	do	Davie & Whittle's Owl Brand Acid Phosphate with Potash.	North Wilkesboro	11.02	2.62	12.54
3061	do	Durham Fertilizer Co.'s Blue Ridge Wheat Grower	Graves Siding	10.41	2.20	11.57
3356	do	do	Asheville	13.75	1.00	13.37
3100	do	Durham Fertilizer Co.'s Standard Wheat Grower	North Wilkesboro	10.77	2.14	11.83
3321	do	Durham Fertilizer Co.'s Bone and Potash Mixture	Hillsboro	10.82	1.50	11.24
3411	do	Lynchburg Guano Co.'s Dissolved Bone and Potash	Elkin	10.46	1.96	11.37
3080	do	Old Dominion Guano Co.'s Alkaline Bone and Potash	Trinity	10.08	2.80	11.87
3222	do	Southern Chemical Co.'s Mammoth Wheat Grower	Maiden	10.00	1.92	10.72
3119	do	J. G. Tinsley & Co.'s Bone and Potash Mixture	Winston-Salem	11.87	2.04	12.72
3442	do	S. W. Travers & Co.'s Capital Bone and Potash	Pittsboro	10.25	2.20	11.42
	Brand claiming			10.00	2.25	11.25
3385	Navassa Guano Co., Wilmington, N. C.	Navassa Wheat Mixture	Lenoir	9.39	2.08	10.53

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.								
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Relative Value per Ton at Factory.		
MIXED FERTILIZERS.												
Brands claiming												
3376	Imperial Co., Norfolk, Va.	Carolina Wheat Mixture.	Steeds.	10.00						3.00	\$ 12.00	
Brands claiming												
3339	Acme Mfg. Co., Wilmington, N. C.	Acme Bone and Potash.		9.94						3.52	12.47	
3445	Adair, A. D., & McCarty Co., Chattanooga, Tenn.	Adair's Wheat and Corn Grower.	Clyde.	10.00						4.00	13.00	
3096	American Agricultural Chemical Co., New York, N. Y.	Zell's High Grade Bone and Potash.	Elkin.	10.46						3.98	13.39	
3299	American Fertilizer Co., Norfolk, Va.	Double Dissolved Bone and Potash.	Rural Hall.	11.74						3.42	13.99	
3263	Armour Fertilizer Works, Greensboro, N. C.	Armour's Superphosphate and Potash.	Sanford.	10.47						3.84	13.26	
3362	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Special Bone and Potash.	Asheville.	10.67						3.78	13.38	
3269	Atlantic Fertilizer Co., Atlanta, Ga.	Atlantic Acid and Potash Mixture.	Albemarle.	10.05						3.96	13.00	
3262	Baugh & Sons Co., Norfolk, Va.	Baugh's 10-4 Phosphate and Potash Mixture.	Liberty.	10.81						3.12	12.85	
3229	Burton, C. J., Guano Co., Baltimore, Md.	Burton's Alkaline.	Mount Airy.	9.84						3.84	12.70	
3348	Bryant Fertilizer Co., Alexandria, Va.	Bryant's Bone and Potash Mixture.	Burlington.	9.94						4.00	12.95	
3210	Carolina-Union Fertilizer Co., Norfolk, Va.	Carolina Union 10-4.	Denton.	9.66						3.84	12.53	
3110	Carolina Warehouse Co., Salisbury, N. C.	Farmers' Union 10-4 Bone and Potash.	Greensboro.	9.83						4.00	12.85	
3358	Columbia Guano Co., Norfolk, Va.	Columbia Bone and Potash Mixture.	Marion.	9.98						4.90	13.88	
3270	Combahee Fertilizer Co., Charleston, S. C.	Combahee Acid Phosphate with Potash.	Albemarle.	10.97						3.78	13.65	
				10.89						4.02	13.82	
				10.62						4.50	14.06	

3168	Conestee Chemical Co., Wilmington, N. C.	Conestee Bone and Potash	Maiden	10.99	3.26	13.15
3180	Farmers Guano Co., Raleigh, N. C.	Special Bone and Potash	Gold Hill	10.77	3.16	12.85
3261	Georgia Chemical Works, Augusta, Ga.	High Grade XX Acid Phosphate with Potash	Siler City	10.76	3.92	13.60
3097	Imperial Co., Norfolk, Va.	Catawba Wheat Grower	Walnut Cove	10.28	3.96	13.21
3368	Marietta Fertilizer Co., Greensboro, N. C.	Marietta Potash Special	Albemarle	10.06	3.82	12.87
3192	do	do	Reidsville	10.04	3.72	12.76
3230	Martin, D. B., Fertilizer Co., Norfolk, Va.	Martin's Potash and Soluble Bone	Pilot Mountain	10.05	3.94	12.98
3201	Navassa Guano Co., Wilmington, N. C.	Navassa Dissolved Bone with Potash	Shelby	9.94	3.80	12.75
3146	do	Navassa Wheat and Grass Grower	Rockwell	10.55	5.00	14.49
3294	Patapasco Guano Co., Baltimore, Md.	Patapasco 10-4 Potash Mixture	Granite Quarry	10.22	3.84	13.04
3457	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Farmers' Bone and Potash	Reidsville	10.47	3.84	13.26
3190	Pocahontas Guano Co., Lynchburg, Va.	Wabash Wheat Mixture	Roxboro	10.15	3.32	12.45
3388	Powhatan Chemical Co., Richmond, Va.	Magie Bone and Potash Mixture	Cornelius	10.13	5.18	14.57
3202	Richmond Guano Co., Richmond, Va.	Rex Bone and Potash Mixture	Shelby	10.02	3.92	12.94
3078	Robertson Fertilizer Co., Norfolk, Va.	Skyscraper Bone and Potash Compound	Glenola	9.66	3.56	12.25
3182	Royster, F. S., Guano Co., Norfolk, Va.	Royster's 10-4 Bone and Potash Mixture	Faith	9.95	3.66	12.81
3075	Swift Fertilizer Works, Wilmington, N. C.	Swift's Farmers' Bone High Grade	Concord	10.25	4.26	13.48
3206	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Acid and Potash	Denton	9.91	4.08	13.00
3181	do	do	Granite Quarry	9.98	3.80	12.78
3422	do	do	Concord	10.04	3.38	12.42
3114	Union Guano Co., Winston, N. C.	Quaker Grain Mixture	Greensboro	10.33	3.92	13.22
3111	United States Fertilizer Co., Baltimore, Md.	Farm Ball Special Mixture	Greensboro	10.74	3.90	13.57
3160	Va.-Car. Chemical Co., Richmond, Va.	Old Dominion Obelisk Bone and Potash	Iron	12.09	3.70	14.58
3138	do	Southern Chemical Co.'s Winner Grain Mixture	Salisbury	10.14	4.76	13.89
3390	do	do	Statesville	9.62	4.86	13.52
3193	do	V.-C. C. Co.'s Special Potash Mixture	Roxboro	9.47	4.22	12.74

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.					Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.		Total Potash.
MIXED FERTILIZERS.										
	<b>Brand claiming</b>									
3099	Va.-Car. Chemical Co., Richmond, Va.	Va. State Fertilizer Co.'s XX Potash Mixture.	North Wilkesboro	10.00						14.00 \$ 13.00
	<b>Brands claiming</b>									
3148	Armour Fertilizer Works, Greensboro, N. C.	Armour's Phosphoric Acid and Potash.	Albemarle	10.32						4.06 13.35
3312	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union 10-5 Bone and Potash.	Troutman	10.00						5.00 14.00
3271	Marietta Fertilizer Co., Greensboro, N. C.	Marietta Potash Mixture.	Albemarle	10.17						4.80 13.96
3400	Pocahontas Guano Co., Lynchburg, Va.	Special Potash Mixture.	Mount Airy	9.32						4.96 13.35
3459	Rasin-Monumental Co., Baltimore, Md.	Rasin's Special Bone and Potash.	Durham	10.29						4.74 14.00
3436	Robertson Fertilizer Co., Norfolk, Va.	J. W. S. Alkaline Bone.	Walnut Cove	14.12						1.80 14.51
3283	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Bone and Potash.	Kernersville.	10.40						4.34 13.70
3318	Union Guano Co., Winston, N. C.	Union Bone and Potash.	Burlington	10.31						5.44 14.72
3113	United States Fertilizer Co., Baltimore, Md.	Farm Bell Ten-five Mixture.	Greensboro.	9.99						4.28 13.27
3346	Va.-Car. Chemical Co., Richmond, Va.	Lynchburg Guano Co.'s Alpine Mixture	Burlington	9.72						4.82 13.57
3320	-----do-----	Va. State Fertilizer Co.'s Mountain Top Bone and Potash.	Hillsboro.	10.40						5.76 15.12
	<b>Brands claiming</b>			9.96						4.60 13.56
3305	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union 10-6 Bone and Potash.	Salisbury.	9.67						5.32 14.02
3421	Tidewater Guano Co., Norfolk, Va.	Tidewater 10-6 Bone and Potash.	Concord.	10.00						6.00 15.00
3071	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Phosphate and Potash.	Concord.	9.97						5.28 14.25
				10.07						5.98 15.04
				10.11						5.84 14.94

3319	Union Guano Co., Winston, N. C.	Union 10-6 Bone and Potash	Burlington	9.89			6.22	15.12
3284	Va.-Car. Chemical Co., Richmond, Va.	Southern Chemical Co.'s Solid South Bone and Potash.	Burlington	9.68			5.24	13.95
<b>Brands claiming</b>								
3191	Patapsco Guano Co., Baltimore, Md.	Patapsco High Grade Phosphate and Potash.	Roxboro	12.19			4.16	15.13
3357	Va.-Car. Chemical Co., Richmond, Va.	Southern Chemical Co.'s Quickstep Bone and Potash.	Asheville	10.52			5.10	14.57
<b>Brands claiming</b>								
3249	Baugh & Sons Co., Norfolk, Va.	Baugh's 12-5 Phosphate and Potash.	Guilford College	11.61			5.98	16.23
3438	Carolina-Union Fertilizer Co., Norfolk, Va.	Carolina Union 12-5	Mount Airy	12.19			4.68	15.65
3228	Powhatan Chemical Co., Richmond, Va.	High Grade Bone and Potash Mixture	Mount Airy	11.85			4.92	15.58
3287	Richmond Guano Co., Richmond, Va.	High Grade Bone and Potash.	Concord	12.45			4.87	16.07
3255	Va.-Car. Chemical Co., Richmond, Va.	Goodman's Special Potash Mixture	Concord	12.54			3.30	14.59
<b>Brands claiming</b>								
3093	Armour Fertilizer Works, Greensboro, N. C.	Armour Phosphate and Potash Fertilizer.	Walnut Cove	12.14			5.96	16.89
3304	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union 12-6 Bone and Potash.	Salisbury	10.86			7.70	17.47
3458	Georgia Chemical Co., Augusta, Ga.	Georgia Bone and Potash.	Durham	12.89			4.40	16.00
3233	Marietta Fertilizer Co., Greensboro, N. C.	Marietta Potash and Acid	Mount Airy	11.76			4.84	15.42
3231	Martin Fertilizer Co., Norfolk, Va.	Martin's Potash and Soluble Bone	Pilot Mountain	12.14			5.50	16.43
2437	do.	do.	Pilot Mountain	11.29			5.92	16.08
3384	Swift Fertilizer Works, Wilmington, N. C.	Swift's Special High Grade Phosphate and Potash.	Newton	10.75			7.20	16.87
3420	Tidewater Guano Co., Norfolk, Va.	Tidewater 12-6 Bone and Potash.	Concord	11.66			6.32	16.81
3169	Union Guano Co., Winston, N. C.	Union 12-6 Bone and Potash.	Conover	11.52			5.08	15.45
3402	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Special High Grade Potash Mixture.	Ararat	11.88			7.10	17.79
<b>Brand claiming</b>								
3130	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Concentrated Bone and Potash.	North Wilkesboro	20.00			4.00	22.00
<b>Brand claiming</b>								
3352	Va.-Car. Chemical Co., Richmond, Va.	Ground Tobacco Stems	Burlington	19.75		1.85	7.00	13.93
						1.91	7.02	15.04

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.					Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	
RAW OR UNMIXED FERTILIZER MATERIALS.									
Brands claiming									
3353	Va.-Car. Chemical Co., Richmond, Va.	Old Dominion Guano Co.'s Royster's Acid Phosphate.	Burlington	12.00					\$ 9.60
3121	do.	J. G. Tinsley & Co.'s Acid Phosphate.	Winston	12.22					9.78
3301	do.	Travers & Co.'s Capitol Dissolved Bone	Winston	13.77					11.10
Brands claiming									
3062	American Fertilizer Co., Norfolk, Va.	Eagle Brand Acid Phosphate.	Ether	13.36					10.69
3295	Etivan Fertilizer Co., Charleston, S. C.	Diamond Soluble Bone.	Salisbury	13.00					10.40
3212	Georgia Chemical Works, Augusta, Ga.	Dissolved Bone Phosphate.	Denton	13.90					11.12
3404	Robertson Fertilizer Co., Norfolk, Va.	Acid Phosphate.	Mocksville	14.37					11.50
3122	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Dissolved Bone.	Mocksville	15.04					12.03
3300	Swift Fertilizer Works, Wilmington, N. C.	Swift's Harrow Standard Grade Acid Phosphate.	North Wilkesboro	13.31					10.65
3412	Union Guano Co., Winston, N. C.	Union Dissolved Bone	North Wilkesboro	13.24					10.59
3274	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's I. N. L. Acid Phosphate.	Lexington	13.14					10.51
3087	do.	Davie & Whittle's Owl Brand Acid Phosphate.	Newson	13.24					10.59
3323	do.	Durham Fertilizer Co.'s Double Bone Phosphate.	Hillsboro	13.96					11.17
Brands claiming									
3391	American Agricultural Chemical Co., New York, N. Y.	Zell's 14 Per Cent Acid Phosphate.	Statesville	14.00					11.20
				15.12					12.10

3354	Armour Fertilizer Works, Greensboro, N. C.	Armour's Star Phosphate.	Hillsboro.	14.59	11.67
3371	Conestee Chemical Co., Wilmington, N. C.	Conestee High Grade Acid Phosphate.	Maiden.	14.14	11.31
3215	Georgia Chemical Co., Augusta, Ga.	Extra Dissolved Bone Phosphate.	Denton.	14.60	11.68
3313	Patapsco Guano Co., Baltimore, Md.	Patapsco Pure Dissolved Phosphate.	Statesville.	15.56	12.45
3328	Pocomoke Guano Co., Norfolk, Va.	Peerless Acid Phosphate.	Sylva.	16.77	13.42
3303	Richmond Guano Co., Richmond, Va.	High Grade Acid Phosphate.	Shelby.	13.73	10.98
3064	Royster, F. S., Guano Co., Norfolk, Va.	Royster's 14 Per Cent Acid Phosphate.	Seagrove.	13.34	10.67
3066	Union Guano Co., Winston, N. C.	Union High Grade Acid Phosphate.	Graves Siding.	13.36	10.69
3322	Va-Car. Chemical Co., Richmond, Va.	Allison & Addison's Acid Phosphate.	Hillsboro.	15.07	12.06
3275	do.	Allison & Addison's Fulton Acid Phosphate.	Lexington.	15.24	12.19
3086	do.	Davie & Whittle's Owl Brand High Grade Dissolved Bone.	Newsom.	14.09	11.27
3378	do.	Southern Chemical Co.'s Red Cross Acid Phosphate.	Seagrove.	14.20	11.36
	<b>Brands claiming</b>			16.00	12.80
3333	Acme Mfg. Co., Wilmington, N. C.	16 Per Cent Acid Phosphate.	Mount Olive.	17.74	14.19
3076	American Agricultural Chemical Co., New York, N. Y.	Zell's 16 Per Cent Acid Phosphate.	Davidson.	16.66	13.33
3195	American Fertilizing Co., Norfolk, Va.	American High Grade Acid Phosphate.	Reidsville.	16.99	13.59
3264	Armour Fertilizer Works, Greensboro, N. C.	Armour's 16 Per Cent Acid Phosphate.	Sanford.	16.00	12.80
3329	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s High Grade Acid Phosphate.	Asheville.	17.55	14.04
3276	Atlantic Fertilizer Co., Atlanta, Ga.	Atlantic Acid Phosphate.	Albemarle.	16.20	12.96
3141	Baugh & Sons Co., Norfolk, Va.	Baugh's 16 Per Cent Acid Phosphate.	Big Lick.	14.72	11.78
3308	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh 16 Per Cent Acid Phosphate.	Troy.	16.44	13.15
3140	Carolina Warehouse Co., Salisbury, N. C.	Farmers' Union 16 Per Cent Acid Phosphate.	Salisbury.	16.44	13.15
3214	Carolina Union Fertilizer Co., Norfolk, Va.	Carolina Union 16 Per Cent Acid Phosphate.	Denton.	16.47	13.18
3223	Columbia Guano Co., Norfolk, Va.	Columbia High Grade 16 Per Cent Acid Phosphate.	Conover.	16.36	13.09
3172	Conestee Chemical Co., Wilmington, N. C.	16 Per Cent Acid Phosphate.	Maiden.	17.40	13.92
3396	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union 16 Per Cent Acid Phosphate.	Newton.	16.48	13.18

## Brands claiming

3333	Acme Mfg. Co., Wilmington, N. C.	16 Per Cent Acid Phosphate	Mount Olive	17.74	14.15
3076	American Agricultural Chemical Co., New York, N. Y.	Zell's 16 Per Cent Acid Phosphate	Davidson	16.66	13.33
3195	American Fertilizing Co., Norfolk, Va.	American High Grade Acid Phosphate	Reidsville	16.99	13.59
3264	Armour Fertilizer Works, Greensboro, N. C.	Armour's 16 Per Cent Acid Phosphate	Sanford	16.00	12.80
3329	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s High Grade Acid Phosphate	Asheville	17.55	14.04
3276	Atlantic Fertilizer Co., Atlanta, Ga.	Atlantic Acid Phosphate	Albemarle	16.20	12.96
3141	Baugh & Sons Co., Norfolk, Va.	Baugh's 16 Per Cent Acid Phosphate	Big Lick	14.72	11.78
3308	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh 16 Per Cent Acid Phosphate	Troy	16.44	13.15
3140	Carolina Warehouse Co., Salisbury, N. C.	Farmers' Union 16 Per Cent Acid Phosphate	Salisbury	16.44	13.15
3214	Carolina Union Fertilizer Co., Norfolk, Va.	Carolina Union 16 Per Cent Acid Phosphate	Denton	16.47	13.18
3223	Columbia Guano Co., Norfolk, Va.	Columbia High Grade 16 Per Cent Acid Phosphate	Conover	16.36	13.09
3172	Conestee Chemical Co., Wilmington, N. C.	16 Per Cent Acid Phosphate	Maiden	17.40	13.92
3396	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union 16 Per Cent Acid Phosphate	Newton	16.48	13.18

## ANALYSES OF COMMERCIAL FERTILIZERS—FALL, SEASON, 1913.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.						Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	
RAW OR UNMIXED FERTILIZER MATERIALS.										
Brands claiming										
3184	Farmers Guano Co., Raleigh, N. C.	16 Per Cent Acid Phosphate	Gold Hill	16.00						\$ 12.80
3211	Georgia Chemical Works, Augusta, Ga.	High Grade Dissolved Bone Phosphate.	Denton	16.79						13.43
3340	Hampton Guano Co., Norfolk, Va.	Supreme Acid Phosphate.	Maiden	15.09						12.07
3063	Imperial Co., Norfolk, Va.	High Grade Tennessee Acid Phosphate.	Esther	17.18						13.74
3077	Interstate Chemical Corporation, Charlotte, N. C.	Acid Phosphate.	Huntersville	16.10						12.88
3150	Lister's Agricultural Chemical Works, Newark, N. J.	Lister's High Grade Acid Phosphate.	Rockwell	16.03						12.82
3237	Marietta Fertilizer Co., Greensboro, N. C.	Marietta Acid Phosphate.	Mount Airy	16.87						13.50
3296	Martin, D. B., Co., Norfolk, Va.	Martin's Acid Phosphate.	Salisbury	16.00						12.80
3265	Navassa Guano Co., Wilmington, N. C.	Navassa 16 Per Cent Acid Phosphate.	Goldston	16.34						13.07
3297	Patapasco Guano Co., Baltimore, Md.	Florida Soluble Phosphate.	Gold Hill	15.93						12.74
3371	Pearsall & Co., Wilmington, N. C.	Pearsall's 16 Per Cent Acid Phosphate.	Lumberton	16.49						13.19
3460	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont 16 Per Cent Acid Phosphate.	Reidsville	15.94						12.75
3088	Pocahontas Guano Co., Lynchburg, Va.	Carrington's S. C. Phosphate, Waukesha Brand.	Trinity	17.37						13.90
3341	Pocomoke Guano Co., Norfolk, Va.	Superb Acid Phosphate.	Maiden	16.73						13.38
3236	Powhatan Chemical Co., Richmond, Va.	Magic Dissolved Bone Phosphate.	Mount Airy	15.82						12.66
3170	Rasin-Monumental Co., Baltimore, Md.	Rasin Acid Phosphate.	Newton	16.20						12.96
				15.21						12.17

13.32	Richmond Guano Co., Richmond, Va.....	Rex Dissolved Bone.....	North Wilkesboro.....	16.67	13.34
13.34	Robertson Fertilizer Co., Norfolk, Va.....	High Grade Acid Phosphate.....	Kings Mountain.....	17.44	13.95
13.35	Royster, F. S., Guano Co., Norfolk, Va.....	Royster's High Grade 16 Per Cent Acid Phosphate.....	Newton.....	16.35	13.08
13.08	Swift Fertilizer Works, Atlanta, Ga.....	Swift's Special High Grade Acid Phosphate.....	Troy.....	17.27	13.82
13.82	Tidewater Guano Co., Norfolk, Va.....	Top Rail Acid Phosphate.....	Concord.....	15.99	12.79
12.79	Tuscarora Fertilizer Co., Greensboro, N. C.....	Tuscarora Acid Phosphate.....	Denton.....	17.15	13.72
13.72	do.....	do.....	Albemarle.....	16.37	13.10
13.10	United States Fertilizer Co., Baltimore, Md.....	Farm Bell Acid Phosphate.....	Efand.....	16.02	12.82
12.82	Union Guano Co., Winston, N. C.....	Union 16 Per Cent Acid Phosphate.....	Greensboro.....	15.01	12.01
12.01	Venable Fertilizer Co., Richmond, Va.....	Venable's Best Acid Phosphate.....	Kings Mountain.....	15.64	12.51
12.51	Va.-Car. Chemical Co., Richmond, Va.....	Davie & Whittle's Owl Brand High Grade Acid Phosphate.....	Rutherfordton.....	17.21	13.77
13.77	do.....	Durham Fertilizer Co.'s Best Acid Phosphate.....	Mocksville.....	16.10	12.88
12.88	do.....	Southern Chemical Co.'s Comet 16 Per Cent Acid Phosphate.....	Maiden.....	16.50	13.20
13.20	do.....	Travers & Co.'s Acid Phosphate.....	North Wilkesboro.....	15.55	12.44
12.44	do.....	V.-C. C. Co.'s 16 Per Cent Acid Phosphate.....	Iron Station.....	17.16	13.73
13.73	do.....	Va. State Fertilizer Co.'s Bull Run Acid Phosphate.....	Winston.....	15.92	12.74
12.74	Brands claiming.....	Special Mixture.....	Elkin.....	24.00	19.20
19.20	Union Guano Co., Winston, N. C.....	V.-C. C. Co.'s Concentrated Acid Phosphate.....	North Wilkesboro.....	21.26	17.01
17.01	Va.-Car. Chemical Co., Richmond, Va.....	Lee's Prepared Agricultural Lime.....	Albemarle.....	23.76	19.01
19.01	Brand claiming.....	Genuine German Kainit.....	Mount Gilead.....	2.25	1.80
1.80	Lee, A. S., & Sons Co., Richmond, Va.....	Muriate of Potash.....	Denton.....	2.54	2.03
2.03	Brand claiming.....	do.....	do.....	12.00	9.60
9.60	Union Fertilizer Co., Norfolk, Va.....	do.....	do.....	13.92	11.14
11.14	Brand claiming.....	do.....	do.....	50.00	40.00
40.00	Tuscarora Fertilizer Co., Greensboro, N. C.....	do.....	do.....	50.96	40.76

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.						Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Potash from Muriate.		Potash from Sulphate.
MIXED FERTILIZERS.											
Brands claiming											
4108	American Fertilizer Co., Norfolk, Va.	American Bone Mixture.	Reidsville.	8.00				.82	1.00	2.00	\$12.64
4507	Armour Fertilizer Works, Greensboro, N. C.	Armour's Slaughter House Fertilizer for Tobacco.	Pilot Mountain.	9.07	.74	.20		.94	1.14	2.04	14.15
3766	Baugh & Sons Co., Norfolk, Va.	Baugh's Grain and Grass Grower.	Burlington.	7.27	.59	1.10		1.69	2.05	1.94	15.58
				8.84	.81	.42		1.23	1.50	2.32	15.44
Brands claiming											
4496	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Comet Guano.	Burnsville.	8.00				.82	1.00	3.00	13.64
4091	Southern Cotton Oil Co., Charlotte, N. C.	Special Grower.	Chapel Hill.	7.74	.65	.52		1.17	1.42	2.32	14.20
4652	Union Guano Co., Winston, N. C.	Sunrise Ammoniated Guano.	Biscoe.	8.45	.14	1.06		1.20	1.46	2.92	15.56
				7.85	.55	.76		1.31	1.59	3.92	16.49
Brands claiming											
4439	American Agricultural Chemical Co., New York, N. Y.	Fidelity Grain Grower.	Catawba.	8.00				.82	1.00	4.00	14.64
4747	Armour Fertilizer Works, Greensboro, N. C.	Armour's 8-1-4 Fertilizer.	Crutchfield.	7.85	.43	.70		1.13	1.37	4.14	15.95
4742	Carolina Union Fertilizer Co., Norfolk, Va.	Carolina Union 1-8-4.	Edenton.	7.75	.19	.96		1.15	1.40	3.92	15.72
3586	Georgia Chemical Works, Augusta, Ga.	Georgia Special Wheat and Corn Grower.	Greensboro.	8.14	.39	.60		.99	1.20	4.00	15.48
3794	do.	do.	Greensboro.	9.30	.93	.20		1.13	1.37	3.40	16.52
6102	do.	do.	Greensboro.	9.27	.82	.20		1.02	1.24	3.40	16.03
4590	Imperial Co., Norfolk, Va.	Fish and Bone Grain Grower.	Greensboro.	8.12	.39	.60		.99	1.20	4.52	15.59
4216	Ober, G., & Sons Co., Baltimore, Md.	Ober's Stag Guano.	Statesville.	7.65	.53	.24		.77	.94	4.16	14.28
			New Bern.	9.34	.43	.48		.91	1.11	4.04	16.27

3565	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Farmers' Favorite.	Monroe.	8.22	.49	.70	1.19	1.45	3.92	16.32
4112	do.	do.	Reidsville.	8.08	.22	.88	1.10	1.34	3.82	15.61
4515	Swift Fertilizer Works, Wilmington, N. C.	Golden Grain Grower, Standard Grade.	Troy.	10.10	.93	2.36	3.29	4.00	5.98	28.89
4511	Union Guano Co., Winston, N. C.	Union Superlative Guano.	Centerfield.	7.64	.59	.24	.83	1.01	4.40	14.76
4462	Winborne Guano Co., Norfolk, Va.	Climax Peanut Grower.	Edenton.	8.39	.29	.44	.73	.89	4.06	14.68
<b>Brands claiming</b>										
4321	Contentnea Guano Co., Wilson, N. C.	Special Formula Fertilizer.	Lucama.	8.18	.35	.76	1.11	1.35	5.06	17.08
4676	Rock Hill Fertilizer Co., Rock Hill, S. C.	Piedmont High Grade Fertilizer.	Pineville.	7.82	.23	.40	.63	.77	4.58	14.26
4846	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Fertilizer, No. 815.	Hendersonville.	7.74	.49	.24	.73	.89	4.16	14.19
<b>Brand claiming</b>										
4592	United States Fertilizer Co., Baltimore, Md.	Farm Bell Wheat, Oat, and Corn Special.	Statesville.	8.00			.82	1.00	6.00	16.64
<b>Brand claiming</b>										
3767	Baugh & Sons Co., Norfolk, Va.	Baugh's Southern States Exceedsior Guano.	Burlington.	8.16	.35	.56	.91	1.01	6.14	17.31
<b>Brand claiming</b>										
3678	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Wheat, Corn, and Peanut Manure.	Maiden.	8.68	.63	.28	.91	1.01	4.00	15.40
<b>Brand claiming</b>										
4838	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Tobacco Fertilizer.	Senora.	8.00			1.03	1.25	3.00	14.53
<b>Brands claiming</b>										
4522	American Agricultural Chemical Co., New York, N. Y.	Detrick's Kangaroo Complete Kom-pound.	Denton.	7.95	.61	.38	.99	1.20	3.90	15.21
3864	Atlantic Chemical Co., Norfolk, Va.	Apex Peanut Grower.	Edenton.	8.17	.78	.24	1.02	1.24	4.38	16.16
<b>Brand claiming</b>										
4053	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Blood and Bone.	Black Mountain.	8.00			1.23	1.50	3.00	15.37
<b>Brands claiming</b>										
4456	Berkley Chemical Co., Norfolk, Va.	Berkley Peanut and Grain Grower.	Edenton.	7.40	1.26	1.10	2.36	2.87	3.02	19.59
4786	Hampton Guano Co., Norfolk, Va.	Hampton's Special Grain and Peanut Fertilizer.	Waco.	8.00			1.00	1.22	4.00	15.40
4819	Va.-Car. Chemical Co., Richmond, Va.	Atlantic and Virginia Fertilizer Co.'s Peanut Grower.	Plymouth.	7.75	.87	.42	1.29	1.57	3.56	15.95
				8.33	.67	.26	.93	1.13	3.24	14.64
				8.04	.55	.64	1.19	1.45	4.00	16.23

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.								Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Potash.	Potash from Sulphate.	Chlorine.		
MIXED FERTILIZERS.													
Brands claiming													
4505	Va.-Car. Chemical Co., Richmond, Va.		Tinsley, J. G., & Co.'s Peanut Grower Edenton.	8.00			1.00	1.22	4.00				\$15.40
4433	do.		V.-C. Co.'s Special Peanut Grower. Edenton.	7.97	.83	.40	1.23	1.50	4.94				17.28
				5.55	1.03	.82	1.85	2.25	3.16				15.92
Brands claiming													
3838	Acme Mfg. Co., Wilmington, N. C.		Cotton-seed Meal Guano.	8.00			1.65	2.00	2.00				16.13
4188	do.		Gem Fertilizer.	8.22	.88	.76	1.64	1.99	2.58				16.87
4493	Adair & McCarty Bros., Chattanooga, Tenn.		Adair's Ammoniated Dissolved Bone.	8.30	.89	.78	1.67	2.03	2.06				16.74
4303	American Agricultural Chemical Co., New York, N. Y.		Canton Chemical Baker's Fish Guano.	7.94	.69	.88	1.57	1.91	2.18				15.92
4524	do.		Detrick's Fish Mixture.	8.05	1.19	.36	1.55	1.88	2.26				16.01
4119	do.		Denton.	7.96	1.09	.48	1.57	1.91	2.08				15.84
4813	do.		Lazaretto Crop Grower.	8.58	1.20	.44	1.64	1.99	2.08				16.69
4013	do.		Red Rooster Fertilizer.	8.04	1.09	.60	1.69	2.05	2.14				16.47
4006	do.		Top Notch Cotton-seed Meal Compound.	8.27	1.08	.98	2.06	2.50	2.84				18.93
3778	do.		Zell's Calvert Grower.	8.30	1.24	.44	1.68	2.04	1.96				16.49
4286	do.		Zell's Fish Guano.	7.43	1.55	.34	1.89	2.30	2.04				16.66
3598	American Fertilizer Co., Norfolk, Va.		Zell's Special Compound for Tobacco.	8.09	1.31	.36	1.67	2.03	2.54			.73	16.83
5942	do.		American No. 2 Fertilizer.	10.39	.38	.74	1.12	1.36	1.56				15.61
			Bone and Peruvian Guano.	9.84	1.43	1.14	2.57	3.12	2.72				22.37

5916	do.	Sharpsburg	10.28	.91	.38	1.29	1.57	1.88	16.75
3959	do.	Fairmont	7.90	1.22	.38	1.60	1.94	2.36	16.19
4109	do.	Reidsville	8.41	1.06	.32	1.38	1.68	1.74	15.10
3789	Armour Fertilizer Works, Greensboro, N. C.	Greensboro	7.74	.56	1.02	1.58	1.92	1.88	15.48
4360	Arps, George L., & Co., Norfolk, Va.	Eure	7.72	1.07	.52	1.59	1.93	2.52	16.14
3585	Asheville Packing Co., Asheville, N. C.	Asheville	6.79	.33	1.06	1.39	1.69	2.52	14.47
4041	Atlantic Chemical Co., Norfolk, Va.	Selma	7.60	1.61	.30	1.91	2.32	2.10	16.96
6107	do.	Franklinton	7.84	.79	.74	1.53	1.86	2.28	15.76
3517	Baugh & Sons Co., Norfolk, Va.	Wadesboro	7.66	1.21	.60	1.81	2.20	2.72	17.22
4509	do.	Kings	8.27	1.01	.64	1.65	2.00	2.78	17.15
3822	do.	Edenton	7.92	1.00	.64	1.64	1.99	5.38	19.40
3769	do.	Burlington	7.86	1.29	.64	1.93	2.35	2.30	17.48
3768	do.	Burlington	7.90	1.35	.60	1.95	2.37	2.14	17.44
4420	do.	Craggy	7.79	1.07	.62	1.69	2.05	2.94	17.05
4171	do.	Fountain	7.67	.99	.64	1.63	1.99	2.48	16.23
4446	do.	Monroe	8.17	1.27	.56	1.83	2.22	2.82	17.86
4389	Bertie Cotton Oil Co., Aulander, N. C.	Windsor	7.52	.27	1.28	1.55	1.88	2.44	15.72
4828	Beta Fertilizer Co., Beta, N. C.	Beta	8.62	1.03	.68	1.71	2.08	3.26	18.20
4089	Blackstone Guano Co., Blackstone, Va.	Roxboro	8.39	.75	.74	1.49	1.81	2.42	16.23
3813	Bragaw Fertilizer Co., Washington, N. C.	Washington	6.90	1.08	.54	1.62	1.97	1.98	14.99
4403	Bryant Fertilizer Co., Alexandria, Va.	Lumberton	8.65	.43	1.14	1.57	1.91	1.98	16.36
4410	Bryant Fertilizer Co., Wilmington, N. C.	Monroe	7.42	.99	.56	1.55	1.88	1.94	15.13
3898	Burton, C. J., Guano Co., Baltimore, Md.	Landis	7.85	.98	.62	1.60	1.94	2.56	16.34
3982	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Warrenton	7.77	1.28	1.36	2.64	3.21	2.88	20.96
4690	do.	Oxford	8.44	1.01	.64	1.65	2.00	2.58	17.11
4565	do.	Lexington	8.88	1.33	.66	1.99	2.42	1.94	18.29



4447	Coöperative Warehouse Co., Salisbury, N. C.	Farmer's Union s-2-2 Guano	Mathews	8.19	1.21	.22	<b>1.43</b>	1.74	2.14			<b>15.52</b>
6044	do	do	Huntley	<b>7.36</b>	.96	.64	<b>1.60</b>	1.94	2.18			<b>15.52</b>
6045	do	do	Huntley	<b>7.70</b>	1.04	.60	<b>1.64</b>	1.99	2.56			16.38
3950	do	Farmer's Union s-2-2 Tobacco Guano	Mount Airy	9.50	1.03	.34	<b>1.37</b>	1.67	<b>1.92</b>	1.92	2.90	16.22
4873	Coveta Fertilizer Co., Newman, Ga.	Coveta Success Guano	Madison	8.30	.73	.82	<b>1.55</b>	1.88	2.42			16.40
4411	Crow Bros., Fertilizer Co., Monroe, N. C.	Crow's Union County Special	Monroe	11.46	.15	1.00	<b>1.15</b>	1.40	2.58			17.72
4691	Dixie Guano Co., Suffolk, Va.	Dixie Standard Guano	Semora	8.82	.71	.80	<b>1.51</b>	1.84	2.24			16.52
3854	Eastern Cotton Oil Co., Hertford, N. C.	Fish and Blood Mixture	Elizabeth City	8.20	.54	.80	<b>1.34</b>	1.63	2.04			15.05
3853	do	Perquinans Favorite	Edenton	8.34	.62	.68	<b>1.30</b>	1.58	2.02			<b>14.99</b>
4514	Farmers Guano Co., Raleigh, N. C.	Farmer's Ammoniated Guano	Troy	7.89	.69	.94	<b>1.63</b>	1.98	2.18			16.13
4223	Farmers Guano Co., Norfolk, Va.	State Standard Guano	Edenton	8.36	1.23	.62	1.85	2.25	2.26			17.55
6094	Farmers Guano Co., Raleigh, N. C.	do	Mount Gilead	8.50	.67	.86	1.73	2.10	<b>1.52</b>			16.44
4472	Farmville Oil and Fertilizer Co., Farmville, N. C.	Columbia Standard	Fountain	8.73	.47	1.06	<b>1.53</b>	1.86	2.26			16.54
3840	General Mfg. Co., New Bern, N. C.	Big Crop Grower	Spring Hope	<b>7.77</b>	.80	.64	<b>1.46</b>	1.78	2.00			<b>15.12</b>
3791	Georgia Chemical Works, Augusta, Ga.	Georgia Special Tobacco	Greensboro	9.55	.98	.36	<b>1.34</b>	1.63	2.04	2.04	3.30	16.26
6046	do	Georgia Formula	Cooper	8.64	.92	.42	<b>1.34</b>	1.68	2.02			<b>15.42</b>
4706	do	XXX Meal Mixture	Youngsville	<b>7.97</b>	.41	1.08	<b>1.49</b>	1.81	<b>1.94</b>			<b>15.37</b>
4748	Hampton Guano Co., Norfolk, Va.	Extra Tobacco Guano	Sloam	<b>7.94</b>	1.11	.54	1.65	2.00	2.20	2.20	7.20	16.15
3669	do	Shirley's Superphosphate	Clinton	<b>7.85</b>	1.17	.48	1.65	2.00	2.16			16.15
5997	do	do	Cooper	8.17	1.18	.38	<b>1.56</b>	1.89	2.10			<b>16.00</b>
4178	Holmes & Dawson, Norfolk, Va.	Triumph Soluble Guano for Cotton, Peanuts, and Corn	Edenton	8.23	1.37	.42	1.79	2.18	2.16			17.08
4759	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard's Exchange Guano	Wendell	7.30	.97	.72	1.69	2.05	2.70			16.37
4033	Imperial Guano Co., Norfolk, Va.	Champion Guano	Mount Gilead	8.01	1.31	.32	<b>1.63</b>	1.98	2.36			16.41
4255	Imperial Co., Norfolk, Va.	Cotton Grower	Broadway	<b>7.57</b>	1.39	.36	1.75	2.13	2.44			16.60
4434	do	Imperial Peanut and Corn Guano	Edenton	<b>7.89</b>	1.07	.42	<b>1.49</b>	1.81	2.02			<b>15.38</b>
4399	do	Premium Guano	Roxboro	8.08	1.13	.46	<b>1.59</b>	1.93	<b>1.92</b>			<b>15.87</b>



3336	N. C. Cotton Oil Co., Henderson, N. C.	Henderson Cotton Grower	Youngsville	8.45	.62	1.24	1.86	2.26	2.88			18.30
3397	N. C. Cotton Oil Co., Wilmington, N. C.	Wilmington Cotton Grower	Dunn	7.95	.48	1.14	1.62	1.97	2.30			16.26
4443	Norfolk Fertilizer Co., Norfolk, Va.	Oriana Crop Grower	Monroe	8.04	1.11	.46	1.57	1.91	2.24			16.07
3750	Ober, G. & Sons Co., Baltimore, Md.	Ober's Special Cotton Compound	Angier	8.74	.71	1.30	2.01	2.44	2.86			19.17
4385	do	Ober's Standard Tobacco Fertilizer	Gibsonville	7.75	.01	1.46	1.47	1.79	2.16		5.10	15.31
4034	Old Buck Guano Co., Richmond, Va.	Old Buck Warsaw Guano	Norwood	8.01	1.29	.34	1.63	1.98	1.88			15.93
4206	Palmetto Guano Co., Columbia, S. C.	Palmetto Special Fertilizer	Polkton	8.05	1.23	.66	1.89	2.30	2.34			17.52
4674	do	Palmetto Standard Fertilizer	Pineville	7.94	.47	1.12	1.59	1.93	2.22			16.04
3363	Patapsco Guano Co., Baltimore, Md.	Sea Gull Ammoniated Guano	Monroe	7.99	1.33	.36	1.69	2.05	2.26			16.55
4089	do	Planters' Favorite	Mebane	8.18	1.18	.46	1.64	1.99	1.94			16.19
4528	do	Sea Gull Ammoniated Guano	Seaboard	7.82	.99	.56	1.55	1.88	2.00			15.55
3828	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters' Standard Fertilizer	Morven	8.14	.72	1.04	1.76	2.14	2.08			16.80
3566	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Cultivator Guano	Monroe	8.45	.81	1.10	1.91	2.32	2.34			17.96
4111	do	do	Reidsville	7.99	.72	.90	1.62	1.97	2.36			16.35
3557	do	Piedmont Fish Guano	Edenton	8.51	.43	1.30	1.73	2.10	2.14			17.06
4288	do	Piedmont Red Leaf Tobacco Guano	Burlington	8.32	.63	1.04	1.67	2.03	2.22		7.40	16.72
3751	Pine Level Oil Mill Co., Pine Level, N. C.	Cotton Grower Fertilizer for All Crops	Benson	8.37	.32	1.46	1.78	2.16	2.34			17.35
3842	Poconatas Guano Co., Lynchburg, Va.	Carrington's Banner Brand Guano	Nashville	8.10	1.30	.44	1.74	2.11	2.02			16.62
3779	Pocomoke Guano Co., Norfolk, Va.	Panlico Superphosphate	Cherryville	8.06	1.31	.40	1.71	2.08	2.14			16.56
4386	do	do	Lewiston	8.12	1.13	.44	1.57	1.91	2.06			15.96
4529	Powhatan Chemical Co., Richmond, Va.	Magic Cotton Grower	Jackson	9.29	1.11	.68	1.79	2.18	2.48			18.36
4663	do	Magic Special Fertilizer	Mocksville	7.19	1.07	.38	1.45	1.76	2.26			14.82
4149	Rasin-Monumental Co., Baltimore, Md.	Rasin Empire Guano	Kinston	8.43	1.54	.48	2.02	2.46	2.52			18.59
3829	Read Phosphate Co., Charleston, S. C.	Read's Blood and Bone Fertilizer	Wadesboro	8.08	1.04	.76	1.80	2.19	2.56			17.39
4807	Reidsville Fertilizer Co., Reidsville, N. C.	Banner Fertilizer	Ashboro	8.50	1.15	.36	1.51	1.84	2.52			16.51
6014	Richmond Guano Co., Richmond, Va.	Edgecombe Cotton Grower	Eagle Springs	8.30	1.02	.68	1.70	2.07	2.50			17.11



4718	Spartanburg Fertilizer Co., Spartanburg, S. C.	Tiger Brand Corn Grower	Hendersonville.	8.20	.89	.66	1.55	1.88	1.92	-----	15.81
3891	Swift Fertilizer Works, Wilmington, N. C.	Swift's Golden Harvest Guano	High Point.	7.65	1.22	1.84	3.06	3.72	3.44	-----	23.18
3588	do.	Swift's Red Star Standard Grade Guano.	Burlington.	8.50	.40	.70	1.10	1.34	2.32	-----	14.59
4692	Tidewater Guano Co., Norfolk, Va.	Double Active Soluble Guano.	Roxboro.	8.47	.91	.56	1.47	1.79	2.12	-----	15.92
5959	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Standard.	Lincolnton.	7.64	.97	.74	1.71	2.08	2.08	-----	16.14
3892	do.	do.	Ashboro.	7.24	.56	.90	1.46	1.76	2.36	-----	15.01
4213	Union Abattoir Co., Norfolk, Va.	Red Star Standard Guano	New Bern.	7.85	1.09	.60	1.69	2.05	2.14	-----	16.30
3532	do.	Standard Grade.	Spring Hope.	8.06	.60	1.50	2.13	2.59	2.26	-----	18.46
6998	Union Guano Co., Winston-Salem, N. C.	Fish Brand Ammoniated Guano for Tobacco.	Greensboro.	9.65	1.01	.34	1.35	1.64	2.28	2.00	1.50
3885	do.	Fish Brand Ammoniated Guano.	Elkin.	9.72	1.00	.34	1.34	1.63	1.82	-----	16.20
3519	do.	Old Honesty Guano.	Wadesboro.	8.52	.75	1.26	2.01	2.44	1.60	-----	17.71
6099	do.	Old Honesty Tobacco Guano.	Winston-Salem.	9.40	.88	.34	1.22	1.48	2.04	2.04	3.10
4573	Upshur, R. L., Guano Co., Norfolk, Va.	G. G. and C., Grain, Grass, and Cotton Guano.	Manson	8.24	.57	1.06	1.63	1.98	2.24	-----	16.50
4114	United States Fertilizer Co., Baltimore, Md.	Farm Bell Standard Guano.	Greensboro	7.79	.88	.90	1.78	2.16	2.70	-----	17.19
4400	Vance Guano Co., Henderson, N. C.	Hot Stuff Vance.	Oxford.	7.77	1.41	.38	1.79	2.18	1.96	-----	16.47
3988	do.	Sterling Cotton Grower.	Warrenton.	7.66	1.22	.64	1.86	2.26	2.28	-----	16.99
4714	Venable Fertilizer Co., Richmond, Va.	Venable's Meal Mixture	Youngsville.	8.34	.87	.84	1.71	2.08	2.42	-----	17.11
3547	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Anchor Brand Fertilizer.	Asheville.	8.83	1.33	.30	1.63	1.98	2.10	-----	16.89
4768	do.	Atlantic and Virginia Fertilizer Co.'s Orient Special for Tobacco.	Mcbane.	10.16	.75	.38	1.13	1.37	1.90	1.90	3.40
4285	do.	Charlotte Oil Fertilizer Co.'s King Cotton Grower.	Graham.	8.79	.82	.46	1.28	1.56	2.00	-----	15.29
4770	do.	Charlotte Oil and Fert. Co.'s Queen of the Harvest C. S. M.	Hillsboro.	8.90	.17	.98	1.15	1.40	1.66	-----	14.50
3537	do.	Davie & Whittle's Owl Brand Guano	Spring Hope.	9.47	1.00	.48	1.48	1.80	2.00	-----	16.74
3520	do.	Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano.	Wadesboro.	8.39	1.15	.50	1.65	2.00	1.50	-----	15.98
4061	do.	Durham Fertilizer Co.'s Progressive Farmer Guano.	Toecane.	8.07	1.62	.42	2.04	2.48	2.28	-----	18.11
4211	do.	Farmers' Favorite Fertilizer, C. S. M.	Maysville.	8.60	.61	1.08	1.69	2.05	2.18	-----	17.02
4195	do.	Norfolk and Car. Chemical Co.'s Genuine Slaughter House Guano.	Waxhaw.	8.42	.87	.90	1.77	2.15	2.02	-----	17.03

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.								Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Potash from Muriate.	Potash from Sulphate.	Chlorine.		
MIXED FERTILIZERS.													
Brands claiming													
3643	Va.-Car. Chemical Co., Richmond, Va.	Old Dominion Guano Co.'s Soluble Guano.	Statesville	8.00			1.65	2.00	2.00				\$16.13
4569	do	Old Dominion Guano Co.'s Old Dominion Soluble Guano.	Lexington	8.65	1.19	.38	1.57	1.91	2.24				16.62
4085	do	Owl Brand Guano	Matthews	9.51	.41	.92	1.33	1.62	1.92				16.06
4159	do	Powers, Gibbs & Co.'s C. S. M. Soluble Ammoniated Guano.	Roseboro.	8.76	1.07	.44	1.51	1.84	1.80				16.03
4062	do	Southern Chemical Co.'s Electric Standard Guano.	Pease	8.49	.55	1.30	1.85	2.25	2.82				18.23
4344	do	Stonewall Guano.	Rutherford	8.45	1.32	.48	1.80	2.19	1.92				17.08
4332	do	Tinsley & Co.'s Lee Brand Guano	Trenton	8.14	1.05	.42	1.47	1.79	1.90				15.40
4536	do	Tinsley & Co.'s Stonewall Guano.	Richland	8.77	1.24	.48	1.72	2.09	2.74				17.86
4220	do	do	Edenton	8.34	1.41	.50	1.91	2.32	2.62				18.15
5926	do	Travers & Co.'s Beef Blood and Bone Fertilizer.	Elizabeth City	6.52	1.07	.60	1.67	2.03	2.12				15.00
4392	do	do	Andrews	6.74	1.19	.58	1.77	2.15	2.04				15.34
4347	do	S. W. Travers & Co.'s National Fertilizer.	Hominy	7.93	1.03	.40	1.43	1.74	2.04				15.18
3774	do	S. W. Travers & Co.'s National Tobacco Special.	Durham	8.94	1.18	.40	1.58	1.92	2.12				10.80
4202	do	V.-C. C. Co.'s Diamond Dust C. S. M.	Marshville	8.10	1.59	.36	1.95	2.37	2.54	2.54	2.90		18.92
3535	do	V. C. C. Co.'s Farmers' Friend Fertilizer.	Spring Hope	7.79	.95	1.10	2.05	2.49	2.92				18.54
6058	do	V.-C. C. Co.'s Plant Food C. S. M.	Harnett	8.99	.59	1.32	1.91	2.32	3.30				19.41
				8.50	.74	1.20	1.94	2.36	2.26				18.06

6081	---do---	Walnut Cove	8.30	.67	1.00	1.67	2.03	2.00	---	---	16.48
3752	---do---	Angier	8.69	.57	1.14	1.71	2.08	3.26	---	---	18.26
5940	---do---	Lillington	8.59	.02	1.34	1.36	1.65	1.88	---	---	15.32
3738	Wilson Chemical Co., Wilson, N. C.	Cotton States Standard	8.00	.75	1.00	1.75	2.13	3.94	---	---	18.49
3858	Winborne Guano Co., Norfolk, Va.	Excelsior Guano	8.60	1.36	.42	1.78	2.16	2.24	---	---	17.46
4372	---do---	Standard Eureka Guano	8.15	1.11	.44	1.55	1.88	2.42	---	---	16.26
3850	Winston Guano Co., Winston, N. C.	Old Honest Guano	8.70	.56	1.12	1.68	2.04	2.32	---	---	17.21
4174	Young, J. R., Fertilizer Co., Norfolk, Va.	J. R. Young's New Process 2-8-2 Guano for Cot., Corn, and Peanuts.	7.93	1.27	.66	1.93	2.35	1.98	---	---	17.22
4574	---do---	Littleton	8.32	1.01	.34	1.35	1.64	2.22	---	---	15.38
<b>Brands claiming</b>											
4477	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard's Fish Compound	8.29	1.23	.34	1.57	1.91	3.20	---	---	17.26
3916	Martin Fertilizer Co., Baltimore, Md.	Martin's Cotton and Tobacco Guano	8.12	1.20	.46	1.66	2.02	3.64	3.23	2.50	17.92
4238	N. C. Cotton Oil Co., Wilmington, N. C.	Maulsby's Cotton Grower	7.82	.47	1.06	1.53	1.86	3.08	---	---	16.54
4073	Pamlico Chemical Co., Washington, N. C.	Rust Proof Cotton Guano	6.94	.90	.86	1.76	2.14	2.98	---	---	16.62
4316	Pocomoke Guano Co., Norfolk, Va.	C. C. C. Crescent Complete Com- pound.	7.69	1.11	.44	1.55	1.88	3.24	---	---	16.67
4231	Robeson Mfg. Co., Lumberton, N. C.	Roberson Special	7.91	.17	1.34	1.51	1.84	4.30	---	---	17.77
4193	Va.-Car. Chemical Co., Richmond, Va.	Lynchburg Guano Co.'s New Era	9.05	1.13	.44	1.57	1.91	2.92	---	---	17.66
<b>Brands claiming</b>											
4564	Burton, C. J., Guano Co., Baltimore, Md.	Carolina Tobacco Special	8.14	1.51	.10	1.61	1.96	3.94	3.94	9.60	18.03
4257	Imperial Co., Norfolk, Va.	Imperial Peanut Grower Guano	7.61	1.09	.68	1.77	2.15	4.90	---	---	19.18
4749	Miller Fertilizer Co., Baltimore, Md.	Special Tobacco Grower	7.91	1.19	.48	1.67	2.03	4.10	4.10	9.30	18.23
<b>Brands claiming</b>											
6104	Armour Fertilizer Works, Greensboro, N. C.	Armour's Stokes County Tobacco Special.	8.16	.65	.94	1.59	1.93	4.92	1.52	3.40	18.94
5920	Baugh & Sons Co., Norfolk, Va.	Baugh's Complete Animal Base Fer- tilizer.	7.74	1.01	.60	1.61	1.96	5.36	---	---	19.09
4662	Enterprise Guano Co., Baltimore, Md.	Enterprise Complete Manure for All Crops.	8.05	.71	.88	1.59	1.93	4.76	---	---	18.68
4487	Josey, N. B., Guano Co., Tarboro, N. C.	Special Peanut Guano	7.67	.43	1.16	1.59	1.93	6.16	---	---	19.74

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.							Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Potash from Muriate.	Potash from Sulphate.		Chlorine.
MIXED FERTILIZERS.												
Brands claiming												
4010	Union Abattoir Co., Norfolk, Va.	Red Star Carolina Special	Benson	8.00			1.65	2.00	5.00			\$19.13
4180	U. S. Fertilizer Co., Baltimore, Md.	Farm Bell Animal Ammoniated	Baltimore	7.55	1.42	.54	1.96	2.38	6.64			21.67
4415	Va.-Car. Chemical Co., Richmond, Va.	Pace's Special 5 Per Cent Potato Guano.	Asheville	8.07	.91	.92	1.83	2.22	4.82			19.77
				8.19	1.37	.30	1.67	2.03	5.72			20.10
Brands claiming												
4554	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Complete Fertilizer.	Asheville	8.00			1.65	2.00	6.00			20.13
4618	Martin Fertilizer Co., Norfolk, Va.	Privott's Special 8-2-6 Guano.	Edenton	7.02	.19	1.22	1.41	1.71	7.22			19.46
4766	Richmond Guano Co., Richmond, Va.	Beeson's Special Fertilizer	Kernersville	7.99	.93	.62	1.55	1.88	5.56			19.26
4557	Va.-Car. Chemical Co., Richmond, Va.	V. C. C. Co.'s Buyers' Mixture	Waynesville	7.91	1.21	.46	1.67	2.03	6.22			20.35
				8.30	1.29	.84	2.13	2.59	5.00			21.42
Brands claiming												
4841	Armour Fertilizer Works, Greensboro, N. C.	Armour's High Grade Potato Fertilizer.	Asheville	8.00			1.65	2.00	10.00			24.13
3876	Union Guano Co., Winston, N. C.	Union Potato Mixture	Rockingham	6.56	.97	.36	1.33	1.62	9.78			21.27
4418	Va.-Car. Chemical Co., Richmond, Va.	Smith's Irish Potato Guano	Asheville	9.68	1.18	.30	1.48	1.80	10.12			25.05
				8.57	1.43	.36	1.79	2.18	8.72			23.95
Brand claiming												
4878	Tidewater Guano Co., Norfolk, Va.	Soil King Soluble Guano.	Rural Hall	8.00			1.85	2.25	4.00			18.97
				8.13	1.19	.66	1.85	2.25	4.06			19.15
Brand claiming												
4196	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters' Blood, Bone, and Potash.	Waxhaw	8.00			2.06	2.50	1.00			16.85
				8.60	1.11	.98	2.09	2.54	1.60			18.12

Brands claiming			8.00	2.06	2.50	2.00	17.85
4221	Acme Mfg. Co., Wilmington, N. C.	Latimer's Complete Fertilizer	7.41	1.21	.88		17.51
4005	Columbia Guano Co., Norfolk, Va.	Fair Bluff					
		Benson	6.03	1.42	.60	2.23	5.40
4425	Lister's Agricultural Chemical Works, Newark, N. J.	Columbia Special Tobacco Guano					
4796	Martin Fertilizer Co., Norfolk, Va.	Lister's Ammoniated Dissolved Bone Phosphate	11.27	1.45	.52	2.46	20.88
		Martin's Tobacco Compound	8.94	1.43	.62	2.44	19.10
4235	Navassa Guano Co., Wilmington, N. C.	Ammoniated Soluble Guano	8.99	1.35	.70	1.92	18.62
4586	Robertson Fertilizer Co., Norfolk, Va.	Robertson's X-Ray Tobacco Grower	7.96	1.35	.64	2.40	17.92
4752	Va.-Car. Chemical Co., Richmond, Va.	Davie & Whittle's Owl Brand Special Tobacco Guano	10.15	1.39	.38	1.98	18.55
6087	do	Virginia State Fertilizer Co.'s Gilt Edge Special Tobacco Guano	9.55	1.49	.46	2.24	19.02
Brands claiming			8.00	2.06	2.50	2.50	18.35
4835	American Agricultural Chemical Co., New York, N. Y.	Slingluff's British Mixture	8.14	1.55	.50	2.58	18.56
4834	American Fertilizer Co., Norfolk, Va.	Bob White Fertilizer for Tobacco	8.84	1.67	.32	2.58	18.89
3804	Meadows, E. H. & J. A., New Bern, N. C.	Meadows' All Crop Guano	10.21	1.08	1.22	3.54	22.39
Brands claiming			8.00	2.06	2.50	3.00	18.85
3469	Acme Mfg. Co., Wilmington, N. C.	Acme Fertilizer	7.74	1.15	1.28	3.04	20.21
3958	American Fertilizer Co., Norfolk, Va.	American No. 1 Fertilizer	8.25	1.44	.56	2.96	18.78
4315	Armour Fertilizer Works, Wilmington, N. C.	Armour's Gold Medal for Tobacco	7.64	.83	1.02	3.10	17.95
4087	Atlantic Chemical Co., Norfolk, Va.	Atlantic Tobacco Grower	8.02	1.58	.60	3.16	23.73
4484	Burton, C. J., Guano Co., Baltimore, Md.	Burton's High Grade	8.13	1.57	.46	2.90	18.72
3841	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh Special Tobacco Guano	8.13	.76	1.36	3.92	20.14
4239	do	Planters' Pride	8.57	.81	1.06	3.12	18.69
4687	Conestee Chemical Co., Wilmington, N. C.	Conestee Crop Grower	8.60	1.37	1.00	5.84	23.53
4628	Contentnea Guano Co., Wilson, N. C.	Brag Cotton Grower	6.87	1.05	1.12	3.56	18.86
4836	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union Tobacco Guano	8.05	1.25	.40	3.66	17.83
3492	Craven Chemical Co., New Bern, N. C.	Marvel Great Crop Grower	8.21	1.09	1.20	3.54	20.55
4090	Imperial Co., Norfolk, Va.	Bright Tobacco Guano	8.10	1.52	.50	2.94	18.71

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.										Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Potash from Muriate.	Potash from Sulphate.	Chlorine.				
MIXED FERTILIZERS.															
Brands claiming.															
4308	Imperial Co., Norfolk, Va.	F. & B. Cotton Guano	Wilmington	8.00				2.06	2.50	3.00					\$18.85
4666	Miller Fertilizer Co., Baltimore, Md.	Miller's High Grade Fertilizer	Burlington	7.95	1.37	.56	1.93	2.35	3.28						18.54
3883	Navassa Guano Co., Wilmington, N. C.	Mogul Guano.	Walnut Cove	8.00	1.51	.42	1.93	2.35	3.46						18.77
4214	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Onslow Farmers' Reliance Guano.	New Bern	9.61	1.38	.26	1.64	1.99	2.72						18.26
4075	Pamlico Chemical Co., Wilmington, N. C.	Quick Grower	Bayboro	8.08	.39	1.76	2.15	2.61	3.16						19.46
3951	Patapsco Guano Co., Baltimore, Md.	Patapsco Special Tobacco Mixture	Mount Airy	7.44	1.14	.98	2.12	2.58	3.74						19.34
4750	do.	Unicorn Guano	North Wilkesboro	8.11	1.73	.42	2.15	2.61	2.24	2.24			6.90		18.57
4110	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Guano for Tobacco	Reidsville	8.14	1.37	.46	1.83	2.22	2.82						17.83
4093	Peachontas Guano Co., Lynchburg, Va.	Spot Cash Tobacco Compound	Mebane	7.99	1.06	1.02	2.08	2.53	3.66	3.66			4.85		19.59
3559	Royster, F. S., Guano Co., Norfolk, Va.	Orinoco Tobacco Guano	Edenton	8.09	1.44	.54	1.98	2.41	3.18	3.18			8.50		18.78
4629	Southern Cotton Oil Co., Goldsboro, N. C.	Echo C. S. M.	Mount Olive	8.06	1.50	.62	2.12	2.58	3.38	3.38			7.90		19.54
4876	Swift Fertilizer Works, Wilmington, N. C.	Swift's Gold Leaf Tobacco Grower	Mount Airy	6.74	.55	1.54	2.09	2.54	2.60						17.44
5943	Union Guano Co., Winston, N. C.	Union Water Fowl Guano	Hope Mills	8.66	.85	1.24	2.09	2.54	3.58			3.58			20.15
4587	United States Fertilizer Co., Baltimore, Md.	Farm Bell Tobacco Grower	Madison	9.74	.97	1.22	2.19	2.66	3.78						21.74
4839	do.	do.	Brown Summit	8.69	1.19	.84	2.03	2.47	3.22	3.22			6.60		19.57
3474	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s N. C. Farmers' Alliance Guano.	Whiteville	8.39	1.09	.92	2.01	2.44	2.96	2.96			8.60		18.95
				9.10	1.89	.22	2.11	2.57	3.26						20.31

3590	do do	Durham Fertilizer Co.'s Pride of Durham Tobacco Grower	Burlington	8.77	1.52	.38	1.90	2.31	3.08	3.08	4.70	18.95
4760	do do	Powers, Gibbs & Co.'s Car. Golden Belt Ammoniated Guano for Tob.	Kenly	8.60	1.71	.46	2.17	2.64	3.88	3.88	3.70	20.73
6086	do do	do do	Mount Airy	7.65	1.55	.60	2.15	2.61	3.24			19.15
4333	do do	J. G. Tinsley & Co.'s Killikinnick Tobacco Mixture	Trenton	9.15	1.43	.26	1.69	2.05	3.06	3.06	7.00	18.39
3772	do do	V.-C. Co.'s Blue Star C. S. M.	Durham	8.21	.60	1.12	1.72	2.09	3.30			17.91
3494	do do	do do	Mount Olive	8.28	1.13		2.31	2.81	2.72			19.87
3952	Venable Fertilizer Co., Richmond, Va.	Venable's Alliance Tobacco Manure, No. 1	Mount Airy	8.35	1.41	.58	1.99	2.42	3.66	3.66	6.20	19.53
<b>Brands claiming</b>												
5941	Acme Mfg. Co., Wilmington, N. C.	Acme Merito	Hope Mills	8.23	1.01	1.24	2.25	2.74	3.86			20.72
4361	Jossey, N. B., Guano Co., Tarboro, N. C.	Jossey's Special Tobacco Guano	Rich Square	8.09	.63	1.16	1.79	2.18	4.50	4.50	12.30	19.30
3918	N. C. Cotton Oil Co., Wilmington, N. C.	Currie's Crop Grower	Clarkton	8.30	.64	1.22	1.86	2.26	4.10			19.38
<b>Brands claiming</b>												
3527	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Pacific Tobacco and Cotton Grower	Spring Hope	8.90	1.19	1.18	2.37	2.88	2.26	2.26	6.30	20.22
4785	Farmville Oil and Fertilizer Co., Farmville, N. C.	Chamblee & Sons' Special Guano	Zebulon	9.65	.87	1.34	2.21	2.69	2.36			20.33
3994	Farmers Cotton Oil Co., Wilson, N. C.	Wilson High Grade Guano	Snow Hill	9.24	1.17	1.08	2.25	2.74	2.48			20.25
4545	N. C. Cotton Oil Co., Henderson, N. C.	American Pet.	Apex	7.98	.73	1.84	2.57	3.12	3.86			21.84
3938	do do	Brewer's Special	Wake Forest	8.32	.82	1.48	2.30	2.80	3.84			20.99
3649	N. C. Cotton Oil Co., Raleigh, N. C.	Raleigh Standard Guano	Lillington	8.06	.83	1.26	2.09	2.54	2.34			18.37
4146	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Favorite Cotton Grower	Snow Hill	8.54	.97	1.22	2.19	2.66	3.02			19.90
4065	Va.-Car. Chemical Co., Richmond, Va.	Va.-Car. Chem. Co.'s Royal Crown C. S. M.	Raleigh	7.62	1.08	1.30	2.38	2.89	2.46			19.31
<b>Brand claiming</b>												
3802	Hadley, Harris & Co., Wilson, N. C.	Hadley's Boss Guano	Wilson	8.32	.88	1.30	2.18	2.65	2.88			19.52
<b>Brand claiming</b>												
4491	Va.-Car. Chemical Co., Richmond, Va.	Lynchburg Guano Co.'s Solid Gold Tobacco Guano	Angier	8.87	1.49	.62	2.11	2.57	3.78	3.72	.06	20.62
<b>Brand claiming</b>												
4610	Union Guano Co., Winston, N. C.	Union Bright Leaf Tobacco Compound.	Clinton	8.61	1.81	.28	2.09	2.54	6.14	6.14	7.30	22.67

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.								Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Potash from Total.	Potash from Muriate.	Potash from Sulphate.		Chlorine.
MIXED FERTILIZERS.													
Brands claiming													
4236	Navassa Guano Co., Wilmington, N. C.	Navassa Cotton-seed Meal Special 3 Per Cent Guano.	Chadbourn.	8.00			2.47	3.00	2.00				\$19.57
4761	Va.-Car. Chemical Co., Richmond, Va.	Powers, Gibbs & Co.'s Cotton-seed Meal Standard Guano.	Kenly.	9.68	1.41	.94	2.35	2.86	3.16				21.74
				9.99	1.43	.82	2.25	2.74	2.10				20.54
Brands claiming													
4625	Acme Mfg. Co., Wilmington, N. C.	Acme Fertilizer.	Mount Olive.	8.20	1.41	1.08	2.49	3.03	2.68				20.07
3837	do	Acme Fertilizer for Tobacco.	Spring Hope.	9.01	.96	1.20	2.16	2.63	2.66	2.66	4.50		20.52
4486	Farmville Oil and Fertilizer Co., Farmville, N. C.	High Grade Tobacco Grower.	Benson.	8.56	1.11	1.20	2.31	2.81	3.86		3.86		19.84
4092	Southern Cotton Oil Co., Charlotte, N. C.	Land Sake Fertilizer.	Chapel Hill.	8.56	.67	1.10	1.77	2.15	2.50				21.27
3753	Va.-Car. Chemical Co., Richmond, Va.	Southern Chem. Co.'s George Washington Plant Bed Fertilizer.	Angier.	9.67	1.67	.34	2.01	2.44	2.32				17.64
4000	do	V.-C. Co.'s Atlas Brand C. S. M.	Greenville.	7.51	1.34	1.40	2.74	3.33	3.06				19.46
4600	do	V.-C. Co.'s Split Silk C. S. M.	Clayton.	9.82	.87	.70	1.57	1.91	3.82				21.33
Brands claiming													
3624	Acme Mfg. Co., Wilmington, N. C.	Acme 8-3-3 Guano.	Williamston.	8.00			2.47	3.00	3.00				19.25
4779	do	8-3-3 C. S. M. Guano.	Baileys.	8.62	1.03	1.34	2.37	2.88	2.96				20.57
4465	do	Acme 8-3-3 C. S. M. Guano for Tobacco.	Fountain.	7.32	1.17	1.20	2.37	2.88	2.72				20.47
3700	do	Best's Fish Scrap Guano.	Goldshoro.	7.35	1.33	1.12	2.45	2.98	3.48	3.48	9.00		19.26
6945	do	do.	Fayetteville.	8.59	1.43	.94	2.37	2.88	3.20				20.38
				7.07	.90	1.32	2.22	2.70	4.22				20.88
													19.91

3651	do	Pee Dee Special Fertilizer	Rowland	8.85	1.29	1.08	2.37	2.88	2.96				20.88
4643	American Agricultural Chemical Co., New York, N. Y.	Canton Chemical Co.'s Baker's Tobacco Fertilizer	Edenton	7.82	2.19	.50	2.69	3.27	3.60	3.60	8.80		21.94
4616	do	Canton Chemical Co.'s Superior High Grade Fertilizer	Edenton	7.84	1.75	.54	2.29	2.78	3.04				19.71
4323	do	Detrick's Victory Cotton Fertilizer	Denton	7.84	1.75	.48	2.23	2.71	3.04				19.46
4814	do	Detrick's Victory Crop Grower	Kings Mountain	7.92	1.75	.62	2.37	2.88	3.26				20.34
3992	do	Eureka Cotton-seed Meal Compound	Snow Hill	8.04	1.97	.42	2.39	2.91	4.06				21.33
4120	do	Lazaretto Challenge Fertilizer	Shelby	7.77	1.76	.68	2.44	2.97	2.78				20.02
3863	do	Lazaretto Special Tobacco and Potato Fertilizer	Edenton	7.95	2.06	.50	2.56	3.11	3.38	3.38	8.20		21.29
3583	do	Zell's Bright Tobacco Grower	Durham	7.90	1.72	.58	2.30	2.80	2.98	1.60	1.38	1.20	19.75
3777	do	Zell's Reliance High Grade Manure	Dallas	8.09	1.85	.58	2.43	2.95	4.78				22.27
5883	American Fertilizer Co., Norfolk, Va.	American Eagle Guano	Plymouth	7.43	2.69	.16	2.85	3.46	3.94				22.60
3652	do	do	Rowland	9.62	.75	.54	1.29	1.57	2.82				16.90
5917	do	do	Sharpsburg	9.90	1.07	1.20	2.27	2.76	3.90				22.34
4457	do	J. G. Miller & Co.'s Yellow Leaf Tobacco Guano	Edenton	7.89	1.49	.88	2.37	2.88	4.28	4.28	6.00		21.33
5918	Armour Fertilizer Works, Wilmington, N. C.	Armour's Cotton Special Fertilizer	Vander	7.95	1.46	.70	2.16	2.63	2.90				19.13
6078	do	do	Fayetteville	7.51	1.62	.64	2.26	2.75	3.18				19.43
4118	do	do	Gastonia	6.90	1.24	1.00	2.24	2.72	2.90				18.55
3477	do	Armour's No. 833 Fertilizer	Goldsboro	7.57	1.65	.74	2.39	2.91	2.92				19.77
3790	do	Armour's Special Fertilizer	Greensboro	7.47	.78	1.58	2.36	2.87	2.88				19.51
3470	do	Armour's Tobacco Special	Wilmington	6.97	1.09	1.00	2.09	2.54	2.94	2.94			17.99
3472	do	Tuscarora Cotton Special	Wilmington	7.67	1.43	.80	2.23	2.71	3.04				19.31
3740	Arps, G. L., & Co., Norfolk, Va.	Arps' Quick Growth for All Crops	Edenton	7.98	1.75	.70	2.45		3.22				20.69
3584	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Complete Fertilizer	Asheville	6.86	.75	2.00	2.75	3.34	3.26				20.98
3865	Atlantic Chemical Co., Norfolk, Va.	Atlantic High Grade Cotton Guano	Edenton	7.96	1.76	.60	2.36	2.87	3.16				20.24
5964	do	Atlantic High Grade Tobacco Guano	Robersonville	8.05	1.45	1.12	2.57	3.12	3.10				21.14
4003	do	do	Penson	7.67	1.58	.66	2.24	2.72	3.24	3.24	6.70		19.55

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.										Relative Value per Ton at Factory.
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Potash from Muriate.	Potash from Sulphate.	Chlorine.			
MIXED FERTILIZERS.														
Brands claiming														
5964	Atlantic Chemical Co., Norfolk, Va.	Atlantic High Grade Tobacco Guano.	Robersonville.	8.00		1.12	2.57	3.12	3.10	3.10		7.00	21.14	\$20.57
4004	Banner Fertilizer Co., Benson, N. C.	B. F. C. Banner Guano.	Benson.	8.44	.88	1.68	2.56	3.11	3.60				21.95	
3505	Baugh & Sons Co., Norfolk, Va.	Baugh's High Grade Tobacco Guano.	Kinston.	7.79	.73	1.89	2.61	3.17	3.38	3.38		7.00	21.35	
3516	do.	Baugh's Grand Rapids High Grade Guano.	Wadesboro.	7.94	1.97	.62	2.59	3.15	3.32				21.34	
4445	Berkley Chemical Co., Norfolk, Va.	Advance Crop Grower.	Monroe.	7.82	1.45	.70	2.15	2.61	2.84				18.91	
3749	do.	Berkley Tobacco Guano.	Benson.	8.02	2.03	.56	2.59	3.15	3.04	3.04		6.80	21.14	
4390	Bertie Cotton Oil Co., Aulander, N. C.	Bertie Cotton Grower.	Windsor.	6.97	.67	1.68	2.35	2.86	3.84				19.98	
4137	Bowler Fertilizer Co., Boston, Mass.	Bowler's Red Oak Tobacco Fertilizer.	Whitakers.	8.08	1.70	.76	2.46	2.99	6.68				24.28	
4757	Bryant Fertilizer Co., Norfolk, Va.	Bryant's Favorite C. S. M. Guano.	Kenly.	9.97	1.27	1.08	2.35	2.86	3.38				22.22	
4050	Burton, C. J., Guano Co., Baltimore, Md.	Burton's Best.	Henderson.	8.69	1.92	.44	2.36	2.87	2.96				20.69	
6088	do.	Burton's Tobacco Queen.	Mount Airy.	7.82	1.87	.58	2.45	2.98	3.54	3.54		7.20	20.87	
5996	Caraleigh Phosphate and Fertilizer Co., Raleigh, N. C.	Carolina Formula for Tobacco.	Dunn.	9.10	1.48	.94	2.42	2.94	2.96	1.82	1.14	1.40	21.31	
4036	do.	Eclipse.	Dunn.	7.72	1.23	1.24	2.47	3.00	3.00				20.92	
3691	do.	Horne's Best.	Lumber Bridge.	7.44	1.03	1.76	2.79	3.39	3.78				22.19	
3931	Carolina Union Fertilizer Co., Norfolk, Va.	Carolina Union 3-8-3.	Louisburg.	7.90	1.40	.92	2.32	2.82	3.46				20.31	
4544	Chatham Oil and Fertilizer Co., Pittsboro, N. C.	Pride of Chatham.	Pittsboro.	8.93	.37	1.48	1.85	2.25	2.88				18.69	

3932	Chesapeake Chemical Co., Baltimore, Md....	C. C. Co.'s Fish Guano.....	Louisburg.....	7.37	1.88	.50	2.38	2.80	3.30	-----	19.93
4043	Clayton Oil Mill, Clayton, N. C. ....	Clayton Guano.....	Clayton.....	8.50	1.30	1.12	2.42	2.94	3.78	-----	21.59
4707	-----do.-----	C. O. M. Planters' Favorite.....	Youngsville.....	8.70	.53	1.64	2.17	2.64	2.86	-----	19.80
5984	Coe-Mortimer Co., Charleston, S. C. ....	Darlington Guano.....	Duke.....	8.50	2.16	.50	2.66	3.23	2.50	-----	21.32
3550	Columbia Guano Co., Norfolk, Va.....	Hyco Tobacco Guano.....	Spring Hope.....	8.00	1.77	.68	2.45	2.98	2.92	6.80	20.41
4243	-----do.-----	Olympia Cotton Guano.....	Edenton.....	8.09	1.67	.68	2.35	2.86	3.00	-----	20.15
4153	Conestee Chemical Co., Wilmington, N. C. ....	Conestee Fish Scrap Guano.....	Four Oaks.....	7.94	1.70	1.12	2.82	3.43	3.10	-----	22.09
5895	Contentnea Guano Co., Wilson, N. C. ....	Pick Leaf.....	Dunn.....	8.66	1.17	1.20	2.37	2.88	2.58	-----	21.33
3701	-----do.-----	-----do.-----	Kinston.....	8.44	1.31	.96	2.27	2.76	3.38	-----	20.51
3599	-----do.-----	Plant Bed Tobacco Grower.....	Dunn.....	8.41	1.11	1.16	2.27	2.76	3.06	2.80	20.16
3907	-----do.-----	Top Notch.....	Fremont.....	8.56	1.06	1.06	2.12	2.58	3.36	-----	19.97
3725	Coöperative Warehouse Co., Salisbury, N. C. ....	Farmers' Union Tobacco Guano.....	Nashville.....	8.25	2.13	.36	2.49	3.03	3.28	2.70	21.16
6043	-----do.-----	Farmers' Union 8-3-3 Guano.....	Hundley.....	7.86	1.96	.60	2.56	3.11	3.40	-----	21.23
3725	-----do.-----	-----do.-----	Nashville.....	8.25	2.13	.36	2.49	3.03	3.28	2.70	21.16
6074	Cooper Guano Co., Wilmington, N. C. ....	Cooper's Lenox.....	Kerr.....	8.54	1.84	.46	2.30	2.80	3.66	-----	21.01
5994	-----do.-----	-----do.-----	Stedman.....	7.84	1.72	.88	2.60	3.16	2.34	-----	20.32
6073	-----do.-----	Cooper's Sunset C. S. M.....	Kerr.....	8.30	1.29	.98	2.27	2.76	4.02	-----	21.02
4037	-----do.-----	-----do.-----	St. Paul.....	8.20	1.25	1.14	2.39	2.91	3.08	-----	20.50
6075	-----do.-----	-----do.-----	Kerr.....	9.11	.96	1.08	2.04	2.48	2.82	-----	19.59
4874	Coweta Fertilizer Co., Newman, Ga.....	Coweta Perfection Tobacco Grower.....	Pilot Mountain.....	7.83	1.81	.38	2.19	2.66	4.20	4.20	20.44
4764	-----do.-----	Seabird Standard Guano.....	Mebane.....	8.74	1.69	.36	2.05	2.49	3.02	-----	19.50
4212	Craven Chemical Co., New Bern, N. C. ....	Duplin Tobacco Guano.....	New Bern.....	7.76	1.65	1.04	2.69	3.27	3.28	6.90	21.56
3807	-----do.-----	Foy's High Grade Guano.....	Vanceboro.....	8.21	1.58	1.10	2.68	3.26	3.12	-----	21.76
3758	-----do.-----	Gaston High Grade Fertilizer.....	Ayden.....	8.35	1.17	1.28	2.45	2.98	3.06	-----	20.86
4412	Crow Fertilizer Co., Monroe, N. C. ....	Crow's High Grade Blood and Fish Guano.....	Monroe.....	10.20	1.67	1.00	2.67	3.25	2.22	-----	22.61
3852	Dixie Guano Co., Suffolk, Va.....	Dixie High Grade.....	Edenton.....	8.49	1.12	1.32	2.44	2.97	3.08	-----	20.97



6103	Georgia Chemical Works, Augusta, Ga.	Greensboro	8.79	2.15	.40	2.55	3.10	3.16	3.12	.04	2.30	21.78
3724	do.	Nashville	9.18	1.57	.28	1.85	2.25	4.14	4.14		4.00	20.17
4672	do.	Iron	6.55	1.97	1.36	2.33	2.83	3.44				19.12
6048	do.	Cooper	9.24	1.36	.44	1.80	2.19	2.48				18.36
4163	Grandy, N. G., & Co., Elizabeth City, N. C.	Elizabeth City	6.97	1.99	.62	2.61	3.17	5.42				22.65
6032	do.	Elizabeth City	8.22	2.00	.62	2.62	3.19	3.14				21.52
3803	Hadley, Harris & Co., Wilson, N. C.	Wilson	8.92	.82	1.56	2.38	2.89	3.08	2.89	.19	2.10	21.12
4318	Hampton Guano Co., Norfolk, Va.	Pine Level	8.70	1.85	.72	2.57	3.12	3.64	3.64		8.60	22.26
3670	do.	P. P. P. Princess Prolific Producer	8.58	1.45	.44	1.89	2.30	2.82				18.48
4007	Horne Fertilizer and Chemical Co., Baltimore, Md.	Benson	7.24	1.91	.48	2.39	2.91	3.58	3.58		5.35	20.13
4605	do.	Clinton	8.12	1.71	.58	2.29	2.78	3.00				19.93
3709	Hubbard Fertilizer Co., Baltimore, Md.	Aloskie	7.95	2.37	.58	2.95	3.59	3.34	3.34		9.50	22.88
5977	do.	Fuquay Springs	8.23	1.80	.22	2.02	2.46	3.52	3.52		5.90	19.41
4504	Imperial Co., Norfolk, Va.	Edenton	7.94	1.95	.44	2.39	2.91	3.32	3.32		10.30	20.50
3747	do.	Fuquay Springs	7.85	1.89	.52	2.41	2.93	3.10				20.29
3515	do.	Wilkesboro	8.01	1.95	.56	2.51	3.05	2.88				20.63
4143	Josey, N. B., Guano Co., Tarboro, N. C.	LaGrange	7.54	.78	1.78	2.56	3.11	3.44	3.44		7.70	20.98
5965	do.	Robersonville	9.37	.79	1.96	2.75	3.34	3.44				23.42
3757	do.	Ayden	8.17	.95	1.32	2.27	2.76	4.06				20.95
5938	do.	Hookerton	8.52	.53	1.54	2.07	2.52	4.32				20.68
5913	do.	Enfield	8.18	.59	1.56	2.15	2.61	3.86				20.25
3929	do.	Spring Hope	7.94	.93	1.26	2.19	2.65	3.62				19.96
4627	do.	Mount Olive	8.03	.83	1.26	2.09	2.54	3.34				19.34
4130	Lee, A. S., & Sons Co., Richmond, Va.	Scotland Neck	8.34	1.88	.38	2.26	2.75	3.32				20.32
4274	Lenoir Oil and Ice Co., Kinston, N. C.	Pink Hill	8.17	.43	1.92	2.35	2.86	3.50			4.80	20.72
4708	Lister's Agricultural Chemical Co., New York, N. Y.	Drewry	7.68	1.85	.52	2.37	2.88	3.00				19.87

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.									Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Potash from Muriate.	Potash from Sulphate.	Chlorine.			
MIXED FERTILIZERS.														
Brands claiming				8.00			2.47	3.00	3.00					\$20.57
3715	MacMurphy Co., Charleston, S. C.	Special 8-3-3 Cotton and Corn Guano.	Whiteville	8.14	1.54	.93	2.47	3.00	3.26					20.97
3717	do	Special 8-3-3 Tobacco Guano.	Tabor	7.95	.81	1.76	2.57	3.12	3.24		3.24			21.19
4312	Marietta Fertilizer Co., Atlanta, Ga.	Marietta, No. 833	Wilmington	7.53	1.49	.68	2.17	2.64	3.02					18.91
6108	Marietta Fertilizer Co., Greensboro, N. C.	Marietta Pride of Piedmont	Franklinton	8.38	2.01	.66	2.67	3.25	2.98					21.74
4694	do	do	Creedmoor	7.85	.79	1.70	2.49	3.03	2.84					20.36
5891	Martin Fertilizer Co., Norfolk, Va.	Martin's Bull Head Fertilizer	Dunn	8.00	2.07	.34	2.41	2.93	3.42					20.74
6037	do	do	Benson	8.00	1.96	.68	2.64	3.21	2.82					21.11
5998	do	do	Dunn	8.07	1.96	.54	2.50	3.04	3.06					20.82
3488	do	do	Mount Olive	8.05	1.86	.36	2.22	2.70	3.54					20.11
3917	do	Martin's Cotton and Tobacco Guano.	Clarkton	9.64	2.06	.42	2.48	3.02	4.86	4.40	.46	3.30	23.95	
5890	do	Martin's Tobacco Special	Dunn	7.59	1.99	.44	2.43	2.95	3.58	3.58		4.50	20.62	
4797	do	do	Zebulon	8.07	2.03	.58	2.61	3.17	3.08	3.08		2.90	21.30	
5877	McNair Phosphate Co., Laurinburg, N. C.	Oceda	Lane	7.69	1.23	1.20	2.43	2.95	3.64					20.77
6066	do	do	Fayetteville	8.55	.94	1.30	2.24	2.72	3.30					20.40
4923	Meadows, E. H. & J. A., Co., New Bern, N. C.	Dixon's High Grade Tobacco Guano.	Hookerton	8.68	1.06	1.16	2.22	2.70	3.30	3.30		7.30	20.44	
5973	do	Meadows' Gold Leaf Tobacco Guano.	New Bern	8.71	.96	1.54	2.50	3.04	4.18	3.40	.78	2.50	22.52	

3502	---do---	Kinston	7.59	1.07	1.28	2.35	2.86	4.94	4.94	21.64
5978	Miller Fertilizer Co., Baltimore, Md.	Dunn	8.54	2.00	.40	2.40	2.92	3.00		20.77
3596	---do---	Dunn	7.91	1.36	.90	2.26	2.75	3.02		19.63
3844	Tobacco King	Franklinton	8.20	1.54	.92	2.46	2.99	3.96	3.96	8.70 21.67
3934	---do---	Wake Forest	7.90	1.68	.80	2.48	3.02	3.96	3.96	9.00 21.49
3408	Navassa Guano Co., Wilmington, N. C.	Whiteville	8.79	.75	1.84	2.59	3.15	3.74	3.74	4.30 22.53
4084	---do---	Matthews	9.49	1.88	.56	2.44	2.97	3.66		22.45
4304	---do---	Ellenboro	7.89	1.26	.88	2.14	2.60	2.52		18.61
4646	---do---	Edenton	5.80	1.39	.84	2.23	2.71	3.70		18.27
3922	---do---	Halifax	10.19	1.12	1.20	2.32	2.82	3.68		22.59
3719	---do---	Chadbourn	7.53	1.33	1.34	2.67	3.25	3.34		21.33
4442	N. C. Cotton Oil Co., Charlotte, N. C.	Matthews	8.15	1.11	1.34	2.45	2.98	2.86		20.48
4256	N. C. Cotton Oil Co., Henderson, N. C.	Lillington	8.25	.71	1.48	2.19	2.66	3.24		19.86
3927	---do---	Youngsville	8.09	.48	1.94	2.42	2.94	3.40	.28 3.12	20.84
3650	N. C. Cotton Oil Co., Raleigh, N. C.	Lillington	8.69	.57	1.18	1.75	2.13	3.10		18.27
3464	N. C. Cotton Oil Co., Wilmington, N. C.	Maxton	8.42	1.13	1.26	2.39	2.91	3.84		21.46
3650	---do---	Wallace	8.02	1.60	.75	2.35	2.86	6.90	1.33 5.57	1.00 23.99
3487	---do---	Warsaw	8.05	.98	1.38	2.36	2.87	3.58		20.74
3405	---do---	Maxton	8.47	1.09	1.28	2.37	2.88	4.26		21.83
3406	---do---	Whiteville	8.30	1.07	1.36	2.43	2.95	3.30		20.98
4869	---do---	LaGrange	7.86	.99	1.20	2.19	2.66	3.08		19.35
3620	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Everetts	7.67	1.37	1.60	2.97	3.61	3.34		22.72
6069	---do---	New Bern	8.46	.42	1.62	2.04	3.48	4.38		20.57
3667	---do---	Gritton	8.54	.45	1.94	2.39	2.91	4.00		21.72
3501	---do---	Kinston	8.39	.66	1.74	2.40	2.92	4.44	4.44	3.80 22.07
3668	---do---	Gritton	8.59	.63	1.50	2.13	2.59	4.96	4.96	5.50 21.64



5878	do.	Pearsall's Use Mo High Grade Guano.	Hallsville	8.74	1.40	.68	2.08	2.53	2.82		20.42
3913	Peruvian Guano Corporation, Charleston, S. C.	Lobos Peruvian Mixture	Fremont	9.06	2.08	.30	2.38	2.89	3.50		21.65
4100	Phillips, F. T., Washington, N. C.	High Grade Cotton Guano	Washington	8.12	.60	.98	2.58	3.14	4.10		22.24
4098	do.	Tobacco Grower	Washington	8.27	.54	1.94	2.48	3.02	3.54	3.54	21.40
5907	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Levering's Reliable Tobacco Guano.	Belhaven	7.97	1.22	1.16	2.38	2.89	3.08	3.08	20.25
3815	do.	Piedmont-Mount Airy High Grade Ammoniated Bone and Potash.	Morven	8.39	1.51	1.18	2.69	3.27	2.92		21.77
3972	Pine Level Oil Mill Co., Pine Level, N. C.	Pine Level High Grade Fertilizer.	Wendell	7.15	1.02	1.26	2.28	2.77	4.20		20.21
3729	Planters Cotton-seed Oil Co., Roeky Mount, N. C.	Planters Cotton-seed Oil Co.'s Tobacco Guano.	Nashville	8.92	1.65	.82	2.47	3.00	3.26	3.26	21.45
4739	do.	Tar River Special	Pinetops	7.87	.99	1.68	2.67	3.25	3.54		21.84
4083	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters' Soluble Guano.	Matthews	8.88	1.27	1.10	2.37	2.88	2.96		20.86
4599	Pocahontas Guano Co., Lynchburg, Va.	Farmers' Favorite Guano, Apex Brand.	Fuquay	7.79	1.91	.64	2.55	3.10	3.62		21.34
5882	Pocomoke Guano Co., Norfolk, Va.	Harvey's High Grade Monarch.	Creswell	7.80	2.17	.44	2.61	3.17	3.08		21.06
3578	do.	do.	New Bern	7.56	2.07	.50	2.57	3.12	3.37		20.93
3728	do.	Monarch Tobacco Grower	Battleboro	8.21	1.41	.96	2.37	2.88	3.08	3.08	20.42
3705	Powhatan Chemical Co., Richmond, Va.	P. C. Co.'s Hustler	Kinston	8.70	1.81	.80	2.61	3.17	3.74		22.53
4147	Rasin-Monumental Co., Baltimore, Md.	Rasin Gold Standard	Kinston	8.75	2.16	.36	2.52	3.06	3.30		21.76
5967	do.	do.	Machpelah	8.19	2.29	.26	2.55	3.10	3.52		21.60
3732	do.	Rasin's Indian Brand for Tobacco.	Nashville	8.84	2.11	.40	2.51	3.05	3.00	3.00	21.50
4579	Read Phosphate Co., Charleston, S. C.	Read's C. S. M. Mixture.	Red Springs	9.37	.29	2.10	2.39	2.91	4.40		22.87
3830	do.	Read's High Grade Cotton Grower	Wadesboro	7.86	1.26	1.40	2.66	3.23	3.52		21.77
4806	Reidsville Fertilizer Co., Reidsville, N. C.	Royal Fertilizer	Ashboro	7.73	1.89	.28	2.17	2.64	3.62		19.69
4488	Richmond Guano Co., Richmond, Va.	Carolina Bright Tobacco Fertilizer	Angier	8.00	1.53	.90	2.43	2.95	3.56	3.56	20.97
3600	do.	Gilt Edge Fertilizer	Dunn	8.62	1.67	.82	2.49	3.03	3.40		21.62
3730	do.	do.	Nashville	8.82	.73	1.74	2.47	3.00	2.90	1.67	21.21
6013	do.	do.	Eagle Springs	8.13	1.76	.70	2.46	2.99	3.04		20.69
4454	Robersonville Guano Co., Robersonville, N. C.	Roberson's High Grade Meal and Fish Guano.	Robersonville	8.27	.83	1.46	2.29	2.78	3.66		20.72



6002	do.	Fayetteville.	7.86	.64	1.08	1.72	2.09	4.70	19.00
6059	do.	Special Cotton Grower	8.38	.80	1.36	2.16	2.63	3.78	20.39
6060	do.	do.	9.03	.72	1.20	1.92	2.33	3.62	19.81
6063	do.	do.	8.30	.72	1.32	2.04	2.48	3.52	19.56
5949	do.	do.	8.32	.62	1.16	1.78	2.16	3.94	18.90
6039	Southern Cotton Oil Co., Goldsboro, N. C.	Edgerton's Old Reliable C. S. M.	9.67	1.12	1.68	2.80	3.40	2.46	22.90
3493	do.	do.	8.25	.93	1.34	2.27	2.76	3.88	20.84
4038	do.	Morning Glory	8.34	.66	1.44	2.10	2.55	3.78	20.11
3482	do.	Thompson's Special Cotton and Tobacco Guano.	8.85	.71	1.58	2.29	2.78	3.80	21.38
3755	do.	Southern Cotton Oil Co.'s Special Cotton Grower C. S. M.	8.19	.56	1.24	1.80	2.19	3.22	18.15
4123	Southern Cotton Oil Co., Shelby, N. C.	Moon High Grade Fertilizer.	6.22	1.12	1.30	2.42	2.94	3.86	19.62
4124	do.	Peacock High Grade Fertilizer	7.69	.79	1.82	2.31	2.81	3.30	19.92
3694	Southern Exchange Co., Maxton, N. C.	Correct Cotton Compound	10.47	1.59	.68	2.27	2.76	3.24	22.20
3921	do.	R. M. C. Special Crop Grower	7.84	1.84	.58	2.42	2.94	2.80	20.02
3601	Swift Fertilizer Works, Atlanta, Ga.	Swift's Carolina High Grade Tobacco Grower.	6.62	2.15	1.26	3.41	4.14	3.76	24.04
3478	do.	Swift's Cotton-seed Meal Compound	7.42	1.41	1.32	2.73	3.32	3.32	21.40
4356	do.	Swift's High Grade Animal Matter Ammoniated.	7.27	.71	1.14	1.85	2.25	2.68	16.99
4008	do.	Swift's Ruralist High Grade Guano.	8.22	1.50	.82	2.32	2.82	3.00	20.14
4879	Tidewater Guano Co., Norfolk, Va.	B. B. Yellow Wrapper Grower.	7.85	1.43	.98	2.41	2.93	2.90	20.08
4877	do.	Sho Nuf Guano	7.42	1.49	.94	2.43	2.95	3.06	19.94
4782	Tomlinson & Co., Wilson, N. C.	Tomlinson's Buster Fertilizer	7.52	1.45	.96	2.41	2.93	3.98	20.87
3658	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Blood and Bone	7.28	1.11	1.12	2.23	2.71	3.08	19.00
3986	do.	Tuscarora Cotton Special	7.37	1.22	1.00	2.22	2.70	3.18	19.14
4780	do.	Tuscarora Tobacco Special	7.33	1.07	.96	2.03	2.47	3.52	18.64
3331	Union Abattoir Co., Norfolk, Va.	Cotton and Tobacco Guano.	8.34	1.87	.58	2.45	2.98	3.38	21.18
4009	do.	Red Star Cotton and Tobacco Guano.	8.29	2.20	.38	2.58	3.14	3.60	21.90



4059	do	High Grade Fertilizer	Toecane	8.67	2.03	.30	2.33	2.83	2.80	20.39
4382	do	Menhaden Fish and Meal Mixture	Fremont	7.92	1.29	.90	2.19	2.66	4.34	20.67
3495	do	Norfolk and Carolina Chemical Co.'s Amazon High Grade.	Warsaw	9.51	1.99	.24	2.23	2.71	2.96	20.88
6085	do	Norfolk and Car. Chem. Co.'s Amazon High Grade Special Tob. Guano.	Madison	10.62	2.05	.36	2.41	2.93	3.02	22.70
4083	do	do	Mebane	7.96	1.81	.34	2.15	2.61	3.06	19.25
3538	do	Norfolk and Carolina Chemical Co.'s Bright Leaf Tobacco Guano.	Spring Hope	8.19	2.31	.40	2.71	3.29	3.56	22.31
3637	do	Old Dominion Farmers' Friend High Grade Fertilizer.	Wallace	8.31	1.09	1.40	2.49	3.03	3.34	21.28
3316	do	Old Dominion Guano Co.'s Farmers' Friend Special Tobacco Fertilizer.	Washington	7.75	.94	1.40	2.34	2.84	3.70	20.50
3605	do	Powers, Gibbs & Co.'s Old Kentucky High Grade Tobacco Manure.	Selma	8.60	2.13	.36	2.49	3.03	2.84	21.04
4053	do	do	Drewry	8.87	1.76	.36	2.12	2.58	3.08	19.97
4647	do	Tinsley & Co.'s Peruvian High Grade Tobacco Guano.	Edenton	7.24	1.73	.92	2.65	3.22	4.28	21.93
3775	do	Travers & Co.'s Big Leaf Tobacco Grower.	Durham	8.02	2.11	.48	2.59	3.15	3.12	21.27
4753	do	Southern Chem. Co.'s George Washington Plant Bed Fert. for Tobacco.	Elkin	10.95	1.65	.34	1.99	2.42	3.08	21.29
4735	do	Special Cotton Fertilizer, Fish and Meal Mixture.	Magnolia	8.40	1.13	1.02	2.15	2.61	3.20	19.79
3510	do	Special High Grade Tobacco Fertilizer.	Kinston	8.12	1.45	1.06	2.51	3.05	3.86	21.71
4221	do	Tinsley & Co.'s Richmond Brand Guano.	Edenton	6.55	1.65	.64	2.29	2.78	2.90	18.41
4516	do	V.-C. C. Co.'s Adams' Special	Troy	7.74	.97	1.38	2.35	2.86	3.22	20.06
5962	do	V.-C. C. Co.'s Diamond C. S. M. Guano.	Robersonville	8.11	1.73	.98	2.71	3.29	2.96	21.64
3763	do	do	Ayden	7.70	1.41	1.14	2.55	3.10	3.24	20.88
4320	do	V.-C. C. Co.'s Gold Medal Brand Guano.	Lucama	7.75	1.83	.56	2.39	2.91	2.92	19.93
4398	do	V.-C. C. Co.'s Gold Medal High Grade Tobacco Guano.	Durham	9.02	1.65	.42	2.07	2.52	2.86	19.67
4158	do	V.-C. C. Co.'s Junibo Peruvian Guano.	Four Oaks	7.73	1.91	.40	2.31	2.81	2.86	19.52
3636	do	V.-C. C. Co.'s Lion's High Grade Tobacco Fertilizer.	Wallace	8.69	2.07	.36	2.43	2.95	4.66	20.69
4052	do	V.-C. C. Co.'s Royal High Grade Fertilizer.	Jackson	7.17	1.89	.98	2.87	3.49	3.96	22.47
3707	do	V.-C. C. Co.'s Valentine's Special	Kinston	8.80	1.93	.34	2.27	2.76	7.16	24.61
5910	do	Virginia State Fertilizer Co.'s Bull Dog Soluble Guano.	Belhaven	6.39	1.64	.74	2.38	2.89	3.52	19.27

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.									Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.	Chlorine.		
MIXED FERTILIZERS.														
Brands claiming														
3387	Vance Guano Co., Henderson, N. C.	Fish Brand Tobacco Manure	Warrenton	8.00			2.47	3.00	3.00					\$20.57
4512	Venable Fertilizer Co., Richmond, Va.	Venable High Grade Tobacco Fertilizer.	Mount Airy	7.25	1.69	.88	2.57	3.12	3.10			3.10		20.42
3979	Wilson Chemical Co., Wilson, N. C.	East Carolina Cotton Grower	Zebulon	8.12	1.47	.74	2.21	2.69	3.52	3.52			6.10	20.11
3978	do	East Carolina Tobacco Grower	Zebulon	8.69	.97	1.38	2.35	2.86	3.40					21.09
3915	do	Gilt Edge Cotton Grower	Fremont	8.63	2.34	.96	2.30	2.80	3.00	.40	2.60			20.43
3904	do	Plant Bed Tobacco Grower	Dunn	8.22	1.42	.82	2.24	2.72	4.84					21.65
3859	Winborne Guano Co., Norfolk, Va.	King Guano	Edenton	8.29	1.51	1.18	3.69	4.49	3.14	3.14		3.40		21.90
3742	Young, J. R., Fertilizer Co., Norfolk, Va.	J. R. Young's 3-8-3 Guano for Cotton	Edenton	8.13	1.37	.70	2.07	2.52	3.18					19.19
Brands claiming														
4466	Acme Mfg. Co., Wilmington, N. C.	Acme Crop Grower for Tobacco	Fountain	8.25	1.41	.60	2.01	2.44	3.90					19.77
4642	American Agricultural Chemical Co., New York, N. Y.	Canton Chemical Homestead Product.	Edenton	8.00			2.47	3.00	4.00					21.57
4402	Atlantic Chemical Corporation, Norfolk, Va.	Boone's Special	Maxton	8.17	1.01	1.08	2.09	2.54	4.04	4.04		10.00		20.17
4865	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Formula 40 Guano	Goldsboro	7.89	1.59	.68	2.27	2.76	4.00					20.63
3901	Carolina Union Fertilizer Co., Norfolk, Va.	Carolina Union 3-8-4	Elizabeth City	8.17	1.45	.98	2.43	2.95	4.12					21.68
3910	Farmers Guano Co., Raleigh, N. C.	Special for Tobacco	Goldsboro	7.37	1.01	1.48	2.49	3.03	4.90					21.99
3995	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard's Royal Ensign	Snow Hill	8.63	1.44	.94	2.38	2.89	4.48			4.62		22.24
				8.60	1.24	1.00	2.24	2.72	4.62					21.77
				7.95	1.76	.60	2.36	2.87	4.24					21.31

3718	MacMurphy Co., Charleston, S. C.	Special Tobacco Guano.	Tabor.	7.74	.77	1.74	2.51	3.05	4.78	4.78	22.29
3467	McNair Phosphate Co., Laurinburg, N. C.	Supply Company Special	Maxton.	8.49	1.21	1.30	2.51	3.05	3.82	-----	22.00
3866	Martin Fertilizer Co., Norfolk, Va.	Privott's Favorite Guano.	Edenton.	8.25	1.74	.50	2.24	2.72	4.00	-----	20.83
4046	Miller Fertilizer Co., Baltimore, Md.	Miller's Quickstep.	Clayton.	8.37	2.05	.46	2.51	3.05	3.64	-----	21.71
4566	Navassa Guano Co., Wilmington, N. C.	Orton Guano.	Lexington.	8.69	1.15	1.08	2.23	2.71	4.00	-----	21.19
4067	Old Buck Guano Co., Richmond, Va.	Old Buck Test Farm Tobacco Guano.	Roxboro.	8.00	1.98	.50	2.48	3.02	4.82	7.20	22.44
4323	Pine Level Oil Mill Co., Pine Level, N. C.	Hale's Special Guano for Tobacco	Pine Level	8.19	.85	1.28	2.13	2.59	4.42	16.30	20.74
3849	Pocahontas Guano Co., Lynchburg, Va.	Indian Tobacco Grower.	Nashville.	8.18	1.92	.54	2.46	2.99	3.98	8.80	21.67
4409	Southern Exchange, Maxton, N. C.	Bull of the Woods Fertilizer.	Maxton.	8.40	1.37	.74	2.11	2.57	4.42	-----	20.84
3636	Va.-Car. Chemical Co., Richmond, Va.	V.-C. Co.'s Lion's High Grade Tobacco Fertilizer.	Wallace.	8.69	2.07	.36	2.43	2.95	4.66	4.80	22.69
<b>Brands claiming</b>											
4812	American Agricultural Chemical Co., New York, N. Y.	Canton Chemical Co.'s Gladiator Cotton Fertilizer.	Kings Mountain.	8.82	1.97	.60	2.57	3.12	2.64	-----	21.37
4762	American Fertilizer Co., Norfolk, Va.	American Tip Top Tobacco Grower.	Kernersville.	8.28	1.57	.74	2.31	2.81	3.94	9.20	21.09
4709	Arnour Fertilizer Works, Greensboro, N. C.	Arnour's Special Formula for Tobacco Fertilizer.	Henderson.	7.62	.71	1.82	2.53	3.08	4.74	.13	22.22
4049	Atlantic Chemical Co., Norfolk, Va.	Pitt County Light Tobacco Special	Scotland Neck.	7.78	1.28	1.22	2.50	3.04	4.54	6.00	22.04
4405	Baugh & Sons Co., Norfolk, Va.	Baugh's Three Score Complete Fertilizer.	Maxton.	7.97	2.01	.62	2.63	3.20	4.98	-----	23.20
4601	Clayton Oil Mill Co., Clayton, N. C.	White Oak Crop Grower.	Clayton.	9.15	.73	1.58	2.31	2.81	5.38	-----	23.32
5983	Coe-Mortimer Co., Charleston, S. C.	Coe-Mortimer Co.'s Tobacco Fertilizer, No. 2.	Duke.	8.10	1.66	.72	2.38	2.89	4.86	.60	22.15
3970	Contentnea Guano Co., Wilson, N. C.	Victor Tobacco Grower.	Wendell.	9.04	1.24	1.16	2.40	2.92	5.50	1.80	23.72
4635	Farmers Cotton Oil Co., Wilson, N. C.	Special Mixture.	Stantonsburg.	8.00	1.07	.96	2.03	2.47	5.06	-----	20.79
4017	Farmville Oil and Fertilizer Co., Farmville, N. C.	Sterling for Tobacco.	Farmville.	8.90	.89	1.18	2.07	2.52	4.96	.14	21.66
4867	Fremont Oil Mill Co., Fremont, N. C.	8-3-3 Compound.	Fremont.	8.31	1.01	1.02	2.03	2.47	4.76	-----	20.76
4866	-----do.	Fremont Oil Mill Co.'s Special Tobacco Fertilizer.	Fremont.	7.37	.99	1.16	2.15	2.61	4.94	.32	20.60
4309	Imperial Co., Norfolk, Va.	Chadbourn Crop Compound.	Wilmington.	7.47	1.81	.52	2.33	2.83	4.70	-----	21.21
6062	Jessey, N. B., Guano Co., Tarboro, N. C.	Jessey's Special Tobacco Guano.	Benson.	8.61	.42	1.78	2.32	2.82	5.22	13.40	22.71
5966	-----do.	-----do.	Robersonville.	9.87	.82	1.62	2.44	2.97	4.94	.92	24.07



4169	Miller Fertilizer Co., Baltimore, Md.	Miller's 8-3-6 Fertilizer	Elizabeth City	8.48	1.87	.48	2.35	2.86	5.92			23.42
4232	Swift Fertilizer Works, Wilmington, N. C.	Swift's Piedmont Tobacco Grower, H. G.	Chadbourn	7.56	.97	1.60	2.57	3.12	6.04		6.04	23.64
	<b>Brands claiming</b>			8.00			2.47	3.00	7.00			24.57
4641	American Agricultural Chemical Co., New York, N. Y.	Solid Gold Tobacco Fertilizer	Edenton	7.45	1.39	.84	2.23	2.71	7.94	2.52	1.90	24.01
3969	Bowler Fertilizer Co., Boston, Mass.	Bowler's Red Oak Tobacco Fertilizer	Zebulon	8.75	1.61	1.64	2.25	2.74	6.96		12.10	24.28
4633	Contentnea Guano Co., Wilson, N. C.	Government Formula, No. 2	Grainger	8.00	1.49	.92	2.41	2.93	7.88			25.20
4042	do	do	Selma	8.45	1.11	1.14	2.25	2.74	7.16			24.21
4019	Farmville Oil and Fertilizer Co., Farmville, N. C.	Big Leaf Tobacco Grower	Farmville	7.93	1.01	1.24	2.25	2.74	7.12		12.60	23.71
4688	Navassa Guano Co., Wilmington, N. C.	Navassa Standard Tobacco Guano	Norman	9.25	1.85	.40	2.25	2.74	5.78		9.00	23.55
4733	Swift Fertilizer Works, Wilmington, N. C.	Swift's Atlantic Tobacco Fertilizer	Wallace	7.25	1.03	1.16	2.19	2.66	8.02	2.80	2.10	23.74
	<b>Brands claiming</b>			8.00			2.47	3.00	7.50			25.07
3962	Cooper Guano Co., Wilmington, N. C.	Cooper's Tobacco Special	Pembroke	8.67	2.42	.36	2.78	3.38	7.58		7.25	27.06
5905	N. C. Cotton Oil Co., Wilmington, N. C.	Best Tobacco Grower	Hobgood	7.40	1.16	1.20	2.36	2.87	8.86	.20	8.66	25.43
3630	do	do	Wallace	8.02	1.60	.75	2.35	2.86	6.90	1.33	5.37	23.99
	<b>Brand claiming</b>			8.00			2.47	3.00	8.00			25.57
4156	Vance Guano Co., Henderson, N. C.	Vance Special Tobacco Manure	Four Oaks	7.33	1.67	.96	2.63	3.20	6.80	1.48	5.32	24.44
	<b>Brands claiming</b>			8.00			2.47	3.00	10.00			27.57
4502	Armour Fertilizer Co., Greensboro, N. C.	Truck and Berry Special Fertilizer	Elizabeth City	8.15	1.53	.76	2.29	2.78	9.66			26.61
3713	Baugh & Sons Co., Norfolk, Va.	Baugh's Fruit and Berry Guano	Chadbourn	8.04	2.25	.48	2.73	3.32	10.82			29.52
4359	Carolina-Union Fertilizer Co., Norfolk, Va.	Carolina-Union	Tunis	8.39	1.03	1.36	2.39	2.91	10.08			27.67
4634	Farmers Cotton Oil Co., Wilson, N. C.	Special Mixture	Stantonsburg	8.06	1.00	1.07	2.07	2.52	7.84			23.79
4074	Paulico Chemical Co., Washington, N. C.	Early Sweet Potato Guano	Bayboro	7.77	1.00	1.32	2.32	2.82	10.30			27.04
3723	Va.-Car. Chemical Co., Richmond, Va.	Va.-Car. Chem. Co.'s High Grade Tobacco Fertilizer	Tabor	8.53	2.47	.28	2.75	3.34	11.00	2.06	8.34	30.23
	<b>Brand claiming</b>			8.00			2.47	3.00	11.00			28.57
4617	Va.-Car. Chemical Co., Richmond, Va.	Va.-Car. Chem. Co.'s Enterprise High Grade	Edenton	8.72	2.37	.46	2.83	3.44	9.78			29.51

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.								Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.		Chlorine.
MIXED FERTILIZERS.													
	Brand claiming.....			8.00			2.67	3.25	5.00				\$23.41
4014	Farmville Oil and Fertilizer Co., Farmville, N. C.	Greene County Special for Tobacco.....	Farmville.....	7.90	1.54	1.06	2.60	3.16	5.80	5.80			23.83
	Brand claiming.....			8.00			2.75	3.34	2.00				20.75
4397	N. C. Cotton Oil Co., Henderson, N. C.	Henderson Standard.....	Creedmoor.....	7.58	.83	1.40	2.23	2.71	2.26				18.45
	Brands claiming.....			8.00			2.88	3.50	5.00				24.30
3806	Farmers Cotton Oil Co., Wilson, N. C.	Regal Tobacco Guano.....	Wilson.....	8.27	1.22	1.56	2.78	3.38	5.12	2.40	2.72	1.80	24.24
4480	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Sovereign Tobacco Grower.....	Greenville.....	8.08	1.67	1.02	2.69	3.27	5.10	5.10		6.80	23.67
	Brands claiming.....			8.00			2.88	3.50	7.00				26.30
3843	American Agricultural Chemical Co., New York, N. Y.	Austin Tobacco Food.....	Nashville.....	8.40	2.04	.64	2.68	3.26	7.80	1.72	6.08	1.30	26.62
4351	Royster, F. S., Guano Co., Norfolk, Va.	Lenoir Special Tobacco Guano, Meal Body.....	Kinston.....	7.18	1.29	1.58	2.87	3.49	7.58	7.58		9.40	26.10
	Brand claiming.....			8.00			2.88	3.50	8.00				27.30
3805	Farmers Cotton Oil Co., Wilson, N. C.	B. B. Special Guano.....	Wilson.....	8.20	1.52	1.28	2.80	3.40	8.22				27.36
	Brands claiming.....			8.00			3.29	4.00	3.00				24.02
3513	Va.-Car. Chemical Co., Richmond, Va.	Travers & Co.'s Capital Tobacco Fertilizer.....	Greenville.....	7.56	2.93	.32	3.25	3.95	3.28	3.28		4.20	23.73
4741	do.....	do.....	Edenton.....	7.87	2.19	.74	2.93	3.56	3.36	3.36		4.30	22.75
	Brands claiming.....			8.00			3.29	4.00	4.00				25.02
3490	Acme Mfg. Co., Wilmington, N. C.	Acme O. K. Fertilizer.....	Mount Olive.....	7.97	1.95	1.40	3.35	4.07	4.16				25.40

5985	do	do	Dunn	7.85	1.76	1.44	3.20	3.89	4.14	24.64
3699	do	Quickstep Fertilizer	Goldsboro	8.44	1.53	1.52	3.05	3.71	4.10	24.51
4815	American Agricultural Chemical Co., New York, N. Y.	Detrick's Kangaroo Komplete Kom-pound.	Kings Mountain	7.90	2.15	.64	2.79	3.39	4.36	23.19
3556	do	Lazaretto Carolina Cotton Feed	Edenton	8.17	.66	2.73	3.39	4.12	4.84	26.43
4475	do	Zell's Popular Tobacco Fertilizer	Ayden	7.08	2.43	.68	3.11	3.78	4.00	23.43
5884	American Fertilizer Co., Norfolk, Va.	N. C. and S. C. Cotton Grower	Plymouth	7.70	2.55	.74	3.29	4.00	3.58	24.33
6076	Armour Fertilizer Works, Wilmington, N. C.	Armour's 8-4-4 Fertilizer	Fayetteville	7.57	2.15	1.26	3.41	4.14	4.20	25.33
3476	do	do	Goldsboro	7.36	1.83	1.26	3.09	3.76	3.78	23.38
4387	Arps, George L., Norfolk, Va.	Arps' Go-a-Head Guano for Truck, Cotton, and Tobacco.	Lewiston	7.82	2.05	1.16	3.21	3.90	4.32	5.70
5962	Atlantic Chemical Co., Norfolk, Va.	Oriental H. G. Guano	Robersonville	8.27	1.97	1.46	3.43	4.17	4.10	25.95
3625	Baugh & Sons Co., Norfolk, Va.	Baugh's Fish, Bone, and Potash	Robersonville	8.37	2.59	.76	3.35	4.07	4.62	26.22
5935	do	do	Kinston	8.15	2.58	.64	3.22	3.91	4.42	25.28
5619	do	do	Oak City	8.24	2.68	.50	3.18	3.87	4.10	24.87
3756	do	Baugh's Yucatan Special Tobacco Guano.	Ayden	7.92	2.43	.90	3.33	4.05	4.30	25.41
4313	Berkley Chemical Co., Norfolk, Va.	Victory Special Crop Grower	Wilmington	7.59	2.03	.76	2.79	3.39	4.20	22.75
4371	Benton, C. J., Guano Co., Baltimore, Md.	Benton's High Grade Tobacco Guano	Edenton	8.21	2.93	.38	3.31	4.02	4.02	25.31
4275	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh Meal and Tankage Mixture	Goldsboro	8.10	1.28	1.92	3.20	3.89	5.38	26.10
3983	do	Special 8-4-4 Fertilizer	Warrenton	6.65	1.83	1.54	3.37	4.10	4.12	24.26
3899	Columbia Guano Co., Norfolk, Va.	Pelican Ammoniated Guano	Elizabeth City	7.96	2.28	1.04	3.32	4.04	4.54	25.65
3847	do	Trojan Tobacco Guano	Franklinton	7.98	2.52	1.40	3.92	4.77	4.60	28.25
5074	Contentnea Guano Co., Wilson, N. C.	Climax Cotton Grower	Kinston	9.00	1.34	1.24	2.58	3.14	4.86	23.80
3506	do	Climax Tobacco Grower	Kinston	8.12	2.01	1.12	3.13	3.81	4.62	11.10
3993	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union Tobacco Guano	Greenville	9.55	2.63	.60	3.23	3.93	4.40	3.60
6041	do	Farmers' Union 8-4-4 Guano	Huntley	8.10	3.12	.48	3.60	4.38	4.46	26.87
4296	do	do	Hildebran	8.24	2.23	.62	2.85	3.46	4.00	23.39
4366	do	do	Salisbury	8.19	2.05	.64	2.69	3.27	4.18	22.85



6072	.....do.....	Snowflake Cotton Grower.....	Chadbourn.....	9.17	1.88	.72	2.60	3.16	4.26	.....	23.43
4310	.....do.....	.....do.....	Wilmington.....	7.48	2.10	.79	2.89	3.51	4.10	.....	22.85
4476	Hubbard Fertilizer Co., Baltimore, Md.....	Hubbard's Noxall.....	Kinston.....	7.01	1.99	.56	2.55	3.10	3.90	.....	20.92
4478	Josey, N. B., Guano Co., Tarboro, N. C.....	Josey's Big Yield Guano.....	Ayden.....	6.84	.65	2.04	2.69	3.27	5.24	.....	22.69
3623	.....do.....	Josey's C. S. Meal and Fish Scrap.....	Robersonville.....	7.90	.71	2.10	2.81	3.42	4.26	.....	23.17
4129	Lee, A. S., & Sons Co., Richmond, Va.....	Lee's 8-4-4 Fertilizer.....	Scotland Neck.....	8.10	2.47	1.42	3.89	4.73	4.32	.....	27.95
6025	.....do.....	.....do.....	Scotland Neck.....	7.63	2.42	.38	2.80	3.40	5.08	.....	23.71
4273	Lenoir Oil and Ice Co., Kinston, N. C.....	Utility High Grade Fertilizer.....	Pink Hill.....	7.94	.84	2.18	3.02	3.67	4.48	.....	24.31
3823	Martin Fertilizer Co., Norfolk, Va.....	Martin's Beef, Blood, and Bone Guano.....	Edenton.....	8.94	2.60	.40	3.00	3.65	4.02	.....	24.67
3671	.....do.....	Martin's Red Star Brand Fertilizer.....	Clinton.....	9.71	2.31	.74	3.05	3.71	4.78	.....	26.33
3594	.....do.....	Martin's Tobacco Special.....	Dunn.....	8.80	1.08	2.37	3.45	4.19	4.38	5.20	26.79
3748	McNair Phosphate Co., Laurinburg, N. C.....	Floradora.....	Rae ford.....	8.32	2.01	.92	2.93	3.56	4.64	.....	24.51
3576	Meadows, E. H. & J. A., Co., New Bern, N. C.....	Meadows' Ideal Tobacco Guano.....	New Bern.....	8.17	1.55	1.84	3.39	2.91	4.40	9.10	25.99
5972	.....do.....	.....do.....	Kenansville.....	7.84	1.84	1.54	3.38	2.89	4.32	8.40	25.57
3595	Miller Fertilizer Co., Baltimore, Md.....	Everett's Special Cotton Grower.....	Dunn.....	8.16	2.61	.38	2.99	3.64	4.06	.....	23.96
3845	.....do.....	Four Per Cent Tobacco Fertilizer.....	Franklinton.....	8.23	2.42	.36	2.78	3.38	3.90	7.50	22.98
3462	Navassa Guano Co., Wilmington, N. C.....	Coree Tobacco Guano.....	Whiteville.....	8.79	2.53	.24	2.77	3.37	4.48	.08 3.30	24.02
4207	.....do.....	Navassa High Grade Fertilizer.....	Polkton.....	8.97	2.93	.30	3.23	3.96	3.54	.....	25.18
3729	.....do.....	Navassa Special Meal Fertilizer.....	Chadbourn.....	8.24	2.17	1.22	3.39	4.12	4.58	.....	26.23
5921	.....do.....	.....do.....	Halifax.....	9.32	2.20	.94	3.14	3.82	3.52	.....	25.10
4711	N. C. Cotton Oil Co., Henderson, N. C.....	Two-in-One for Cotton.....	Youngsville.....	8.62	1.07	1.88	2.95	3.59	3.88	.....	24.03
4555	N. C. Cotton Oil Co., Wilmington, N. C.....	Wilmington Full Value.....	Kinston.....	8.02	1.61	1.44	3.05	3.71	4.12	.....	24.15
4731	.....do.....	Wilmington Tobacco Guano.....	Wallace.....	7.77	1.61	1.36	2.97	3.61	5.30	5.30	24.77
3463	.....do.....	Wilmington Truck Grower.....	Maxton.....	8.83	1.09	2.18	3.27	3.98	4.80	.....	26.48
5879	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.....	Oriole Tobacco Grower.....	Resaca.....	9.10	1.33	1.92	3.25	3.95	5.18	1.72 3.46	27.02
3666	.....do.....	.....do.....	Grifton.....	8.77	1.01	1.82	2.83	3.44	4.34	.74 3.60	24.12



3507	Powhatan Chemical Co., Richmond, Va.	North State Special	Kinston	8.34	2.29	.98	3.27	3.98	4.42	25.66
4148	Rasin-Mountmental Co., Baltimore, Md.	Rasin's Dixie High Grade Guano	Kinston	8.48	2.37	.72	3.09	3.76	3.92	24.53
4578	Read Phosphate Co., Charleston, S. C.	Read's High Grade Cotton Guano	Gibson	7.12	.47	2.00	2.47	3.00	4.28	21.06
3925	Richmond Guano Co., Richmond, Va.	Perfection Special	Concord	8.22	2.12	.84	2.96	3.60	4.50	24.33
3919	Roberson Mfg. Co., Lumberton, N. C.	Gold Dollar	Lumberton	8.05	1.53	1.66	3.19	3.88	4.10	24.74
4452	Robersonville Guano Co., Robersonville, N. C.	Roberson's 4 Per Cent Special Guano	Robersonville	8.40	1.35	1.62	2.97	3.61	4.20	24.23
3558	Royster, F. S., Guano Co., Norfolk, Va.	Jupiter High Grade Guano	Roper	8.00	2.21	.84	3.05	3.71	4.36	24.37
5971	do	Milo Tobacco Guano	Kinston	7.60	2.04	1.24	3.28	3.99	4.64	25.26
3579	do	do	Kinston	7.73	2.08	1.06	3.14	3.82	4.16	24.30
5945	do	Royster's High Grade Special Tobacco Guano	Hope Mills	8.00	2.29	1.18	3.47	4.22	4.38	26.15
3508	do	do	Greenville	7.81	2.45	.78	3.23	3.93	4.18	24.77
4121	do	Truckers' Delight	Swannanoa	7.96	1.97	1.26	3.23	3.93	4.40	25.13
3761	Scotland Neck Guano Co., Scotland Neck, N. C.	Biggs' Cotton-seed Meal and Fish Scrap Guano	Ayden	8.05	1.14	1.70	2.84	3.45	4.52	23.69
4233	Southern Cotton Oil Co., Charlotte, N. C.	Conqueror	Lumberton	9.88	2.11	.42	2.53	3.08	3.58	23.10
4853	Southern Cotton Oil Co., Concord, N. C.	Conqueror High Grade Fertilizer	Goldston	6.87	1.43	1.74	3.17	3.85	4.20	23.70
6061	Southern Cotton Oil Co., Fayetteville, N. C.	Southern Cotton Oil Co.'s Special Mixture	Fayetteville	9.84	.92	1.38	2.30	2.80	4.82	23.34
4547	do	do	Jonesboro	8.07	1.29	1.34	2.63	3.20	4.08	22.39
3734	Southern Cotton Oil Co., Goldsboro, N. C.	do	Enfield	8.07	1.67	1.08	2.75	3.34	4.92	23.73
4048	Swift Fertilizer Works, Wilmington, N. C.	Atlantic Cotton and Corn Fertilizer	Smithfield	7.27	1.61	1.72	3.33	4.05	4.20	24.73
3602	do	Swift's Majestic for Tobacco, High Grade	Smithfield	7.93	1.27	2.14	3.41	4.14	4.44	25.90
3479	do	Swift's Monarch High Grade	Goldsboro	8.09	1.66	1.95	3.61	4.39	3.58	26.02
4580	Tuscarora Fertilizer Co., Wilmington, N. C.	Tuscarora No. 844	Red Springs	7.42	1.95	.98	2.93	3.56	3.90	22.88
3533	Union Abattoir Co., Norfolk, Va.	Cotton Guano	Spring Hope	8.08	2.67	.82	3.49	4.24	4.72	27.19
4490	do	Red Star Brand Cotton Guano	Benson	8.51	2.53	1.45	2.99	3.64	4.34	24.56
5993	Union Guano Co., Winston, N. C.	Union Premium Guano	Stedman	7.56	3.28	.26	3.54	4.30	3.72	25.39
3706	do	do	Kinston	6.20	2.35	1.34	2.69	3.27	3.54	24.07



4261	Young, J. R., Fertilizer Co., Norfolk, Va.	Young's Crop Grower	Edenton	8.07	2.55	.60	3.15	3.83	3.74	---	---	24.23
	<b>Brands claiming</b>			8.00	---	---	3.29	4.00	5.00	---	---	26.02
4363	American Fertilizer Co., Norfolk, Va.	Peruvian Mixture Guano	Elizabeth City	6.60	2.75	.48	3.23	3.93	5.40	---	---	24.91
4461	Royster, F. S., Guano Co., Norfolk, Va.	Cobb's High Grade for Tobacco	Edenton	8.30	1.81	.90	2.71	3.29	4.92	---	7.70	23.77
4152	Va.-Car. Chemical Co., Richmond, Va.	Long Leaf Tobacco Grower	LaGrange	7.57	1.80	1.26	3.06	3.72	7.16	5.60	1.56	26.82
	<b>Brands claiming</b>			8.00	---	---	3.29	4.00	6.00	---	---	27.02
4558	Armour Fertilizer Works, Greensboro, N. C.	Fertilizer No. 846	Pleasant Garden	7.04	1.67	1.02	2.69	3.27	5.48	---	---	23.11
4276	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Rhankatte Special Tobacco Guano	Goldsboro	9.62	1.94	.78	2.72*	3.31	5.24	1.00	4.24	25.32
4179	Carolina-Union Fertilizer Co., Norfolk, Va.	Carolina-Union 4-8-6 Guano	Edenton	7.97	2.13	.96	3.09	3.76	5.96	---	---	26.11
6040	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union Guano	Huntley	7.54	3.26	.56	3.82	4.64	6.30	---	---	29.13
6047	---do---	Farmers' Union Tobacco Guano	Cooper	8.57	2.38	.40	2.78	3.38	5.88	---	6.10	25.27
4334	---do---	---do---	Trenton	8.25	2.45	.54	2.99	3.64	5.06	---	4.60	25.04
3731	Richmond Guano Co., Richmond, Va.	Bone and Blood Special for Tobacco	Nashville	8.79	2.35	.98	3.33	4.05	7.56	1.02	6.54	29.46
4609	Union Guano Co., Winston, N. C.	Union Guano for Cotton and Tobacco	Clinton	8.89	2.47	.40	2.87	3.49	5.94	---	5.80	25.99
3782	Va.-Car. Chemical Co., Richmond, Va.	Buyers' Special Mixture	Morganton	8.57	2.60	.22	2.82	3.43	6.24	---	---	25.80
	<b>Brands claiming</b>			8.00	---	---	3.29	4.00	7.00	---	---	28.02
4155	United States Fertilizer Co., Baltimore, Md.	Farm Bell Excelsior Guano	Four Oaks	8.44	2.05	1.12	3.17	3.85	6.68	---	---	27.59
4181	---do---	---do---	Washington	8.95	1.99	1.02	3.01	3.66	6.42	---	---	27.12
	<b>Brand claiming</b>			8.00	---	---	3.29	4.00	8.00	---	---	29.02
4383	Powlhatan Chemical Co., Richmond, Va.	Copeland's Magic Fertilizer	Fremont	7.52	2.43	.60	3.03	3.68	7.94	---	---	27.43
	<b>Brands claiming</b>			8.00	---	---	3.70	4.50	7.00	---	---	29.74
4144	Contentne Guano Co., Wilson, N. C.	Tobacco Grower	Kinston	8.41	1.35	1.98	3.33	4.05	8.06	---	8.06	29.61
4020	Farmville Oil and Fertilizer Co., Farmville, N. C.	Davis' Special Guano	Farmville	7.97	1.41	1.58	2.99	3.64	7.96	---	---	27.69
3809	Powlhatan Chemical Co., Richmond, Va.	Tomlinson's Best Fertilizer	Wilson	8.51	2.42	1.02	3.44	4.18	6.20	---	---	28.31
4139	Southern Cotton Oil Co., Rocky Mount, N. C.	Secco Tobacco Grower	Whitakers	7.49	1.96	1.58	3.54	4.30	6.92	---	5.70	28.53

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.								Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Potash from Muriate.	Potash from Sulphate.	Chlorine.		
MIXED FERTILIZERS.													
Brand claiming				8.00			4.00	4.86	7.00				\$31.00
4057	Beta Fertilizer Co., Beta, N. C.	Beta Special	Brevard	9.29	2.70	.04	2.74	3.33	6.12				25.99
Brands claiming				8.00			4.11	5.00	5.00				29.46
3980	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Extra High Grade Vegetable Special.	Asheville	7.75	2.34	1.32	3.66	4.45	5.08				27.43
3573	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' Lobos Guano.	New Bern	8.54	1.95	2.00	3.95	4.80	5.38				29.66
4335	do	do	Trenton	7.97	2.15	1.84	3.99	4.85	5.46				29.39
2610	Norfolk Fertilizer Co., Norfolk, Va.	Tobacco Special Mixture.	Carthage	8.51	3.32	.86	4.18	5.08	7.08	1.33	5.75	1.00	32.29
5883	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont General Truck Grower	Plymouth	8.11	2.82	1.22	4.04	4.91	4.96				29.23
4451	Powhatan Chemical Co., Richmond, Va.	King Trucker	Robersonville	7.39	3.93	1.22	5.15	6.26					29.40
4416	Va.-Car. Chemical Co., Richmond, Va.	Virginia Trucker	Asheville	9.04	2.87	.32	3.19	3.88	6.00				27.53
Brand claiming				8.75			1.86	2.26	4.00				19.69
4047	Navassa Guano Co., Wilmington, N. C.	Farmers' Mixture.	Wilmington	9.74	.32	1.42	1.74	2.11	4.18				20.25
Brands claiming				8.00			4.11	5.00	7.00				31.46
3471	Armour Fertilizer Works, Wilmington, N. C.	Armour's Blood, Bone, and Meal Mixture.	Wilmington	7.70	2.41	1.68	4.09	4.97	5.92				30.03
3606	Eastern Cotton Oil Co., Hertford, N. C.	Tankage and Fish Substitute Peruvian Guano for Truck.	Elizabeth City	6.47	2.23	1.44	3.67	4.46	7.56				28.80
4401	N. C. Cotton Oil Co., Wilmington, N. C.	Wilmington Pride	Maxton	8.26	1.93	2.10	4.03	4.90	6.30				30.66
4700	Southern Cotton Oil Co., Spartanburg, S. C.	Sunrise High Grade Fertilizer	Tryon	9.10	2.59	1.14	3.73	4.53	6.36				30.23

4039	Southern Exchange Co., Maxton, N. C.	McKimmion's Special Truck Formula.	St. Paul	7.52	2.94	.68	3.62	4.40	7.92	29.89
5991	Tuscarora Fertilizer Co., Wilmington, N. C.	Tuscarora Trucker	Stedman	7.64	2.40	1.64	4.04	4.91	7.06	30.90
5990	do	do	Stedman	7.85	2.28	1.60	3.88	4.72	6.80	30.16
5992	do	do	Stedman	8.42	1.96	1.60	3.56	4.33	6.18	28.71
3618	Va.-Car. Chemical Co., Richmond, Va.	V-C-C. Co.'s Invincible High Grade Fertilizer.	Elizabeth City	5.90	3.67	.58	4.25	5.17	7.16	30.32
	Brand claiming			8.00			4.11	5.00	8.00	32.50
4612	Acme Mfg. Co., Wilmington, N. C.	Pumpelly's Special Tobacco Fertilizer	Samaround	8.66	.23	4.22	4.45	5.41	7.96	34.44
	Brand claiming			8.00			4.11	5.00	10.00	34.50
4419	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s Extra High Grade Vegetable Special.	Asheville	7.27	2.87	.76	3.63	4.41	10.34	32.13
	Brand claiming			8.00			6.99	8.50	3.50	40.06
3965	Peruvian Guano Corporation, Charleston, S. C.	Peruvian Guano Top Dresser.	Fairmont	7.06	6.00	.12	6.12	7.44	4.00	36.06
	Brand claiming			8.25			2.08	2.53	2.75	18.91
4508	Baugh & Sons Co., Norfolk, Va.	Baugh's Colonial Tobacco Guano.	Kings Mountain	8.45	1.35	.54	1.89	2.30	3.36	18.90
	Brand claiming			8.50			1.65	2.00	1.50	16.08
4388	American Fertilizer Co., Norfolk, Va.	Peruvian Mixture	Windsor	7.50	1.39	.50	1.89	2.30	2.02	16.71
	Brands claiming			8.50			1.65	2.00	2.00	16.58
4277	Pocomoke Guano Co., Norfolk, Va.	Electric Crop Grower	Goldsboro	8.17	1.31	.42	1.73	2.10	2.34	16.96
3881	do	do	Sylva	7.89	1.34	.46	1.80	2.19	2.18	16.84
	Brand claiming			8.50			2.06	2.50	2.50	18.80
4278	Pocomoke Guano Co., Norfolk, Va.	Cinco Tobacco Guano	Goldsboro	8.52	1.41	.48	1.89	2.30	2.70	18.31
	Brands claiming			9.00			.82	1.00	2.00	13.54
4495	Adair & McCarty Bros., Chattanooga, Tenn.	Adair's Blood, Bone, and Tankage Guano.	Spruce Pine	8.94	.47	.28	.75	.91	1.54	12.74
4297	American Fertilizer Co., Norfolk, Va.	American Bone Mixture	Hildebran	9.09	.55	.28	.83	1.01	1.98	13.65
4880	Baugh & Sons Co., Norfolk, Va.	Baugh's Grain and Grass Grower	Gold Hill	8.70	.27	.72	.99	1.20	1.96	13.95
4673	Columbia Guano Co., Norfolk, Va.	Columbia Special 1-9-2 Guano	Lincolnton	9.02	.57	.44	1.01	1.23	2.36	14.72
4667	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Special 1-9-2 Guano	Kernersville	9.90	.53	.48	1.01	1.23	2.30	15.45



Brands claiming		9.00	1.03	.50	1.53	2.00	1.00	16.03
4555	Royster, F. S., Guano Co., Norfolk, Va.	Special Compound	Waynesville					15.72
4345	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Star Brand Guano	Lenoir	.73	.99	1.20	2.24	15.68
Brands claiming		9.00			1.65	2.00	2.00	17.03
4069	Peachontas Guano Co., Lynelburg, Va.	Yellow Tobacco Special	Roxboro	.72	2.18	2.65	2.94	19.51
4772	Ober, G., & Sons Co., Baltimore, Md.	Ober's Special Ammoniated Dissolved Bone	Albemarle	.74	1.45	1.76	2.04	16.12
4621	Rasin-Monumental Co., Baltimore, Md.	Rasin's Dixie Guano	Cornelius	.38	1.53	1.86	2.72	17.61
4698	Southern Cotton Oil Co., Spartanburg, S. C.	Palmetto Standard Fertilizer	Tryon	.01	1.26	1.54	3.06	17.04
4702	Spartanburg Fertilizer Co., Spartanburg, S. C.	Tiger Brand Boll Buster	Saluda	.93	.80	1.73	2.10	17.70
4878	do.	do.	Harris	.68	1.61	1.96	2.12	17.52
3850	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Star Brand Guano	Durham	.90	1.24	1.51	1.16	15.58
4681	do.	Charlotte Oil and Fertilizer Co.'s Queen of the Harvest	Hillsboro	.23	1.53	1.86	2.28	16.61
Brands claiming		9.00			1.65	2.00	3.00	18.03
4603	American Fertilizer Co., Norfolk, Va.	American Excelstor Guano	Clinton	.36	1.67	2.03	3.28	18.22
4816	Columbia Guano Co., Norfolk, Va.	Roanoke Ammoniated Guano	Lawndale	.97	1.57	1.91	3.32	18.14
6050	Craven Chemical Co., New Bern, N. C.	Prolix Special Guano	Lucama	.68	1.66	2.02	3.76	19.77
4307	Georgia Chemical Co., Augusta, Ga.	Good as Gold Guano	Autryville	.27	.99	1.20	1.86	15.47
4311	Marietta Fertilizer Co., Atlanta, Ga.	Marietta Blood, Bone, and Potash	Wilmington	.71	1.29	1.57	3.36	16.18
4197	Navassa Guano Co., Wilmington, N. C.	Oseola Guano	Waxhaw	1.19	1.55	1.88	3.58	18.95
4413	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Blood and Fish Guano	Monroe	.91	1.73	2.10	3.38	19.48
4664	Powhatan Chemical Co., Richmond, Va.	N. C. Favorite	Mocksville	1.19	1.65	2.00	3.50	18.28
4203	Richmond Guano Co., Richmond, Va.	Bumper Crop Ammoniated Guano	Marshville	1.21	1.73	2.10	3.14	19.05
4414	do.	C. & B.'s Best Fertilizer	Monroe	1.39	1.95	2.37	2.96	20.10
4298	Royster, F. S., Guano Co., Norfolk, Va.	Viking Ammoniated Guano	Waco	1.73	2.07	2.52	3.72	19.56
4125	Southern Cotton Oil Co., Charlotte, N. C.	Razen High Grade Fertilizer	Red Springs	.73	1.24	1.97	2.40	18.39
3693	Southern Cotton Oil Co., Shelby, N. C.	do.	Shelby	.87	.80	1.67	2.03	17.46



3998	Pocomoke Guano Co., Norfolk, Va.....	Monticello Animal Bone Fertilizer.....	Snow Hill.....	8.90	.31	1.66	1.97	2.40	3.98	20.26
6082	Va.-Car. Chemical Co., Richmond, Va.....	V.-C. C. Co.'s Cuban Special Mixture.....	Walnut Cove.....	9.76	1.61	.32	1.93	2.35	4.18	21.07
6083	.....do.....	.....do.....	Mount Airy.....	9.89	1.23	.36	1.59	1.93	3.56	19.14
	<b>Brand claiming</b> .....			9.00			2.06	2.50	2.00	18.75
3984	Patapsco Guano Co., Baltimore, Md.....	Patapsco Guano.....	Warrenton.....	8.70	1.55	.48	2.03	2.47	2.50	18.86
	<b>Brands claiming</b> .....			9.00			2.06	2.50	5.00	21.75
4006	Columbia Guano Co., Norfolk, Va.....	Parrish's Special.....	Benson.....	9.11	1.32	.72	2.04	2.48	5.32	22.09
4406	Powhatan Chemical Co., Richmond, Va.....	Johnson's Best Fertilizer.....	Benson.....	8.94	1.33	.66	1.99	2.42	4.52	20.92
4854	Tuscarora Fertilizer Co., Greensboro, N. C.....	Tuscarora Fertilizer No. 9-21-5.....	Siler City.....	7.47	1.33	.42	1.75	2.13	4.84	18.91
4480	Union Abattoir Co., Norfolk, Va.....	Johnson's High Grade.....	Benson.....	9.14	1.79	.30	2.09	2.54	5.62	22.62
4769	Va.-Car. Chemical Co., Richmond, Va.....	Allison & Addison's Star Brand Special High Grade.....	Mebane.....	9.39	1.33	.28	1.61	1.96	4.08	19.29
	<b>Brands claiming</b> .....			9.00			2.26	2.75	2.00	19.59
3475	Acme Mfg. Co., Wilmington, N. C.....	Acme Cotton Grower.....	Goldsboro.....	9.95	1.03	1.36	2.39	2.91	2.04	21.03
3702	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.....	Pacific Tobacco and Cotton Grower.....	LaGrange.....	9.08	.95	1.34	2.29	2.78	2.38	20.17
5923	Columbia Guano Co., Norfolk, Va.....	Columbia C. S. M. Special.....	Godwin.....	8.85	.88	1.16	2.04	2.48	2.36	18.89
4468	Contentnea Guano Co., Wilson, N. C.....	Special Cotton Grower.....	Fountain.....	8.53	1.09	1.04	2.13	2.59	2.88	19.50
6042	Coöperative Warehouse Co., Salisbury, N. C.....	Farmers' Union 9-2-75-2.....	Huntley.....	8.84	1.48	.82	2.30	2.80	1.92	19.54
4470	Farmville Oil and Fertilizer Co., Farmville, N. C.....	Specific Cotton Grower.....	Fountain.....	8.80	.65	1.48	2.13	2.59	2.90	19.77
4183	Pamlico Chemical Co., Washington, N. C.....	Prosperity Cotton Grower.....	Washington.....	8.42	1.19	1.34	2.53	3.08	2.70	20.90
4473	.....do.....	.....do.....	Fountain.....	9.69	.93	1.12	2.05	2.49	2.56	19.89
3716	MacMurphy (The) Co., Charleston, S. C.....	Wileox, Gibbs & Co.'s Manipulated Guano.....	Whiteville.....	8.56	.83	1.30	2.13	2.59	2.30	18.97
3703	Navassa Guano Co., Wilmington, N. C.....	Big Bolt Special.....	LaGrange.....	9.55	1.22	1.07	2.29	2.78	2.32	20.53
3848	N. C. Cotton Oil Co., Wilmington, N. C.....	Cockrell & Williams' Cotton Grower.....	Nashville.....	8.85	.96	1.28	2.24	2.72	2.68	20.05
3560	Royster, F. S., Guano Co., Norfolk, Va.....	Royster's Meal Mixture.....	Edenton.....	9.27	.81	1.28	2.09	2.54	2.30	19.42
3733	Southern Cotton Oil Co., Goldsboro, N. C.....	Goldsboro Cotton Grower C. S. M.....	Nashville.....	7.93	.83	1.32	2.15	2.61	2.98	19.15
3481	.....do.....	.....do.....	Goldsboro.....	9.17	.38	1.52	1.90	2.31	2.00	18.23

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.								Relative Value per Ton at Factory.		
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Sulphate.		Chlorine.	
MIXED FERTILIZERS.														
Brands claiming					9.00			2.26	2.75	2.00				\$19.59
4608	Union Guano Co., Winston, N. C.	Union Perfect Cotton Grower	Clinton		9.35	1.45	.40	1.85	2.25	1.72				17.70
4693	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Star Brand Special Tobacco Manure.	Durham		9.24	1.71	.38	2.09	2.54	2.10	4.12	1.24	3.10	19.19
3627	do.	Va.-Car. Chemical Co.'s Prolific Cotton Grower.	Williamson		8.09	.93	1.24	2.17	2.64	2.36				18.75
3534	do.	do.	Spring Hope		10.99	.38	1.38	1.76	2.14	1.94				19.22
3943	do.	Va.-Car. Chemical Co.'s Southern Cotton Grower C. S. M.	Edenton		8.97	.89	.98	1.87	2.27	2.70				18.63
4432	do.	V.-C. C. Co.'s White Stem C. S. M.	Williamston		8.12	1.67	1.20	2.87	3.49	2.66				22.02
3737	Wilson Chemical Co., Wilson, N. C.	W. C. Co.'s Cotton Guano	Westrys		8.87	1.37	1.10	2.47	3.00	3.10				21.46
Brand claiming					9.00			2.47	3.00	2.00				20.47
4100	Va.-Car. Chemical Co., Richmond, Va.	Powers, Gibbs & Co.'s C. S. M. Standard Guano.	Roseboro.		9.42	1.49	1.32	2.81	3.42	2.46				22.74
Brands claiming					9.00			2.47	3.00	3.00				21.47
4250	Armour Fertilizer Works, Wilmington, N. C.	Armour's African Cotton Grower Fertilizer.	Maysville		8.17	1.53	.68	2.21	2.69	3.26				19.89
6091	Augusta Chemical Co., Augusta, Ga.	Mascot Blood and Bone Guano.	Hendersonville		10.04	1.91	.60	2.51	3.05	2.70				22.28
3873	Bryant Fertilizer Co., Alexandria, Va.	Bryant's Meal Mixture.	Raeftord		9.17	1.46	1.10	2.56	3.11	3.96				22.96
4710	N. C. Cotton Oil Co., Henderson, N. C.	Pride of Vance Tobacco Fertilizer	Henderson		9.42	.87	1.50	2.37	2.88	3.10		3.10		21.53
3935	do.	do.	Youngsville		9.52	.40	2.02	2.42	2.94	2.92		2.92		21.65
3710	Patapsco Guano Co., Baltimore, Md.	Patapsco Tobacco Fertilizer	Rocky Mount		8.57	1.87	.54	2.41	2.93	3.06			6.70	20.89

4068	Poehontas Guano Co., Lynchburg, Va.....	Poehontas Special Tobacco Fertilizer	Roxboro	8.29	2.02	.50	2.52	3.06	3.06	3.06	8.70	21.10
4577	Read Phosphate Co., Charleston, S. C.....	Read's High Grade Guano	Gibson.....	9.61	1.99	.40	2.39	2.91	3.22			21.91
4824	Southern Cotton Oil Co., Gibson, N. C.....	Uncle Sam Fertilizer.....	Rowland.....	9.25	.99	1.18	2.17	2.64	3.66			21.10
3976	Vance Guano Co., Henderson, N. C.....	Farmers' Union Vance H. G. Guano	Zebulon.....	7.96	1.52	.88	2.40	2.92	4.06			21.30
4712	do.....	do.....	Henderson.....	8.82	1.63	.88	2.51	3.05	2.66			21.14
4002	Va.-Car. Chemical Co., Richmond, Va.....	V.-C. C. Co.'s Formula 101 Tobacco Mixture.	Grifton.....	8.41	.96	1.44	2.40	2.92	2.80	2.80	4.60	20.45
4517	do.....	V.-C. C. Co.'s N. & R.'s Best.	Troy.....	9.07	1.55	1.04	2.59	3.15	3.22			22.25
4588	do.....	Westfield's High Grade Special Tobacco Grower.	Walnut Cove.....	9.22	1.97	.28	2.25	2.74	3.02	.62	2.40	20.77
	Brands claiming.....			9.00			2.47	3.00	4.00			22.47
4024	Swift Fertilizer Works, Wilmington, N. C.....	Swift's Champion High Grade Guano	Mooresville.....	6.80	.94	1.08	2.02	2.46	2.18			16.78
4140	United States Fertilizer Co., Baltimore, Md.....	Farm Bell.....	Whitakers.....	8.72	1.24	1.16	2.49	3.03	4.60			22.53
	Brand claiming.....			9.00			2.47	3.00	5.00			23.47
3912	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.....	Greene County Tobacco Fertilizer.....	Fremont.....	9.01	1.04	1.38	2.42	2.94	5.30	5.30	5.70	23.57
	Brands claiming.....			9.00			2.47	3.00	6.00			24.47
3908	Powhatan Chemical Co., Richmond, Va.....	Guilford Special Tobacco Fertilizer.....	Wilson.....	9.32	1.60	.82	2.42	2.94	6.20	5.72	.48	24.75
4875	Reidsville Fertilizer Co., Reidsville, N. C.....	Lion Brand Fertilizer.....	Madison.....	9.40	1.88	.48	2.36	2.87	6.08			24.45
4066	Union Guano Co., Winston, N. C.....	Union Gold Leaf Tobacco Mixture.....	Clinton.....	9.17	1.65	.32	1.97	2.40	5.94	5.94	5.60	22.47
	Brands claiming.....			9.00			2.47	3.00	7.00			25.47
6049	Hampton Guano Co., Norfolk, Va.....	Davis's Special for Cotton.....	Fremont.....	8.87	1.76	.70	2.46	2.99	5.36			23.67
4775	Rock Hill Fertilizer Co., Rock Hill, S. C.....	Piedmont Black Jack Fertilizer.....	Pineville.....	7.52	1.39	1.10	2.49	3.03	7.50			24.73
	Brands claiming.....			9.00			2.88	3.50	5.00			25.20
3991	American Fertilizer Co., Norfolk, Va.....	Pitt County Special Fertilizer.....	Greenville.....	8.45	2.96	.72	3.68	4.47	8.18			31.24
4729	do.....	Special Formula Guano for Yellow Leaf Tobacco.	Magnolia.....	9.71	1.37	.34	1.71	2.08	3.08	3.08	2.70	19.00
3973	Richmond Guano Co., Richmond, Va.....	Sanders' Special Formula for Bright Tobacco.	Zebulon.....	10.17	2.19	.80	2.94	3.57	4.92	.64	4.28	26.42
	Brand claiming.....			9.00			3.29	4.00	4.00			25.92
3971	Farmers Cotton Oil Co., Wilson, N. C.....	Whitley's Special 9-4-4 Guano.....	Wendell.....	9.44	1.57	1.67	3.24	3.94	5.31			27.12

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.								Relative Value per Ton at Factory.	
				Available Phosphate.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Potash from Nitrate.	Potash from Sulphate.	Chlorine.		
MIXED FERTILIZERS.													
Brands claiming				9.00	---	---	3.29	4.00	4.00	---	---	\$25.92	
6065	Imperial Co., Norfolk, Va.	Bryant's Special	Rowland	8.97	1.24	1.72	2.96	3.60	3.64	---	---	24.15	
4773	Ober, G., & Sons Co., Baltimore, Md.	Ober's Special High Grade Fertilizer.	Albemarle	8.60	2.25	.54	2.79	3.39	3.32	---	---	22.77	
Brand claiming				9.50	---	---	4.11	5.00	3.00	---	---	28.81	
4852	Swift Fertilizer Works, Wilmington, N. C.	Swift's Special	Siler City	9.19	1.43	2.14	3.57	4.34	3.44	---	---	26.70	
Brand claiming				10.00	---	---	.82	1.00	1.00	---	---	13.44	
6016	Richmond Guano Co., Richmond, Va.	Premium Corn Grower	Eagle Springs	9.89	1.40	.26	1.66	2.02	1.26	---	---	17.13	
Brands claiming				10.00	---	---	.82	1.00	3.00	---	---	15.44	
4494	Adair & McCarty Bros., Chattanooga, Tenn.	McCarty's Corn Special	Tooeane	9.80	.29	.44	.73	.89	2.74	---	---	14.63	
4497	Chickamauga Fertilizer Works, Chattanooga, Tenn.	Chickamauga Corn Special	Burnsville	9.51	.35	.46	.81	.98	3.06	---	---	15.02	
4556	Royster, F. S., Guano Co., Norfolk, Va.	Haywood County Special	Waynesville	9.24	.65	.40	1.05	1.28	3.38	---	---	16.11	
3657	Swift Fertilizer Works, Wilmington, N. C.	Swift's Planters' Special Standard Grade Guano.	Conover	7.75	1.39	.92	2.31	2.81	2.28	---	---	18.96	
Brand claiming				10.00	---	---	.82	1.00	3.50	---	---	15.94	
4157	Vance Guano Co., Henderson, N. C.	Vance Corn and Grain Grower	Four Oaks	9.82	.51	.44	.95	1.16	3.20	---	---	16.03	
Brands claiming				10.00	---	---	1.25	1.52	2.90	---	---	16.25	
4680	Dixie Guano Co., Suffolk, Va.	Dixie Monticello Brand	Hillsboro	10.50	.47	.56	1.03	1.25	2.56	---	---	16.34	
4765	do.	do.	Hillsboro	10.49	.73	.66	1.39	1.69	2.30	---	---	17.58	

	Brand claiming			10.00	.42	.82	1.00	4.00	16.40
4022	Farmville Oil and Fertilizer Co., Farmville, N. C.	Pitt County Corn Grower	Farmville	9.89	.42	.40	.82	1.00	4.14
	Brand claiming			10.00			1.23	1.50	4.00
4533	Pamlico Chemical Co., Washington, N. C.	Martin County Peanut Grower	Washington	9.46	.59	.82	1.41	1.71	4.36
	Brands claiming			10.00			1.65	2.00	2.00
4351	Adair, A. D., & McCarty Bros., Atlanta, Ga.	Old Time Fish Scrap Guano	Franklin	9.36	.85	.70	1.55	1.88	2.00
4349	Armour Fertilizer Works, Atlanta, Ga.	Armour's Ammoniated Dissolved Bone and Potash Fertilizer.	Franklin	10.08	1.02	.54	1.56	1.89	1.94
4352	Marietta Fertilizer Co., Atlanta, Ga.	Marietta Royal Seal Guano.	Franklin	9.30	.87	.68	1.55	1.88	3.88
4558	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Sovereign Crop Producer.	Waynesville	9.42	1.19	.42	1.61	1.96	3.52
4843	Welborn Fertilizer Co., Charleston, S. C.	Welborn Banner Bearer	Ayden	9.85	.83	.72	1.55	1.88	2.16
	Brands claiming			10.00			1.65	2.00	4.00
4355	Farmers Guano Works, Dillard, Ga.	Special for Corn	Franklin	9.80	1.11	.28	1.39	1.69	4.30
4353	Marietta Fertilizer Co., Atlanta, Ga.	Langford's Special	Franklin	8.97	.99	.80	1.79	2.18	3.44
	Brands claiming			10.00			1.65	2.00	5.00
4840	Armour Fertilizer Works, Greensboro, N. C.	Armour's No. 10-2-5 Fertilizer	Asheville	9.70	1.13	.42	1.55	1.88	4.24
4794	Farmers Cotton Oil Co., Wilson, N. C.	Washington Corn Mixture Guano	Wilson	9.80	.41	.70	1.11	1.35	7.08
	Brand claiming			10.00			1.03	1.25	6.00
4348	Armour Fertilizer Works, Greensboro, N. C.	Armour's Special Mixture Fertilizers	Canton	9.44	.54	.40	.94	1.14	5.72
	Brands claiming			10.00			2.47	3.00	3.00
4350	Adair, A. D., & McCarty Bros., Atlanta, Ga.	Adair's High Grade Blood and Bone Guano.	Franklin	9.98	1.00	1.12	2.12	2.58	2.74
4086	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	10-3-3 Fertilizer	Ellerbe	10.50	1.41	1.08	2.49	3.03	3.30
4346	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Fertilizer No. 10-3-3	Rutherfordton	9.19	1.50	.54	2.04	2.48	4.00
4567	Va.-Car. Chemical Co., Richmond, Va.	Va.-Car. Chemical Co.'s Farmers' Success.	Lexington	8.90	.87	.82	1.69	2.05	3.40
	Brands claiming			10.00			3.29	4.00	4.00
3736	Union Guano Co., Winston, N. C.	Union Prolife Cotton Compound	Westrys	9.49	3.39	.28	3.67	4.46	4.88
4568	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Electric High Grade Special.	Lexington	10.85	1.45	.98	2.43	2.95	3.92

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.								Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.		Chlorine.
MIXED FERTILIZERS.													
Brand claiming.													
4844	Welborn Fertilizer Co., Charleston, S. C.	Welborn High Grade Fertilizer	Ayden	10.00			3.29	4.00	4.00				\$26.82
Brand claiming.													
4548	Armour Fertilizer Works, Greensboro, N. C.	Armour's No. 10-4-5 Fertilizer	Taylorsville	10.00	.87	1.88	2.75	3.34	4.02				24.97
Brand claiming.													
4717	Spartanburg Fertilizer Co., Spartanburg, S. C.	Tiger Brand Corn Formula	Hendersonville	10.15	1.83	1.08	2.91	3.54	5.66				27.82
Brand claiming.													
4513	Powhatan Chemical Co., Richmond, Va.	Magic Corn Special	Mount Airy	10.50		.76	1.65	2.00	5.00				27.02
Brand claiming.													
4354	Farmers Guano Works, Dillard, Ga.	High Grade Corn Grower	Franklin	10.67	.93	.62	1.69	2.05	5.00				21.38
Brands claiming													
4751	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Concentrated Ammoniated Fertilizer.	North Wilkesboro.	12.00	.37	.82	1.00	1.22	2.00				21.70
4719	do	do	Brevard	12.24		.62	.99	1.20	2.04				14.80
Brand claiming.													
4701	Southern Cotton Oil Co., Spartanburg, S. C.	A-Corn Standard Fertilizer	Tryon	12.00		.24	.82	1.00	5.00				17.21
Brand claiming.													
4699	Southern Cotton Oil Co., Spartanburg, S. C.	Big Ear Corn Standard Fertilizer	Tryon	11.91	.39	.24	.63	.77	4.32				18.24
Brands claiming													
4751	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Concentrated Ammoniated Fertilizer.	North Wilkesboro.	16.00		.20	3.29	4.00	4.00				17.68
4719	do	do	Brevard	15.10	3.09	.22	3.29	4.00	3.08				32.22
Brand claiming.													
4701	Southern Cotton Oil Co., Spartanburg, S. C.	A-Corn Standard Fertilizer	Tryon	16.17	1.95	.22	2.67	3.25	4.10				30.49
Brand claiming.													
4699	Southern Cotton Oil Co., Spartanburg, S. C.	Big Ear Corn Standard Fertilizer	Tryon	7.50		1.75	2.06	2.50	3.00				29.87
Brand claiming.													
4701	Southern Cotton Oil Co., Spartanburg, S. C.	A-Corn Standard Fertilizer	Tryon	7.71	.05	1.75	2.13	3.78					18.40
Brand claiming.													
4699	Southern Cotton Oil Co., Spartanburg, S. C.	Big Ear Corn Standard Fertilizer	Tryon	7.50		2.47	3.00	5.50					18.07
Brand claiming.													
4699	Southern Cotton Oil Co., Spartanburg, S. C.	Big Ear Corn Standard Fertilizer	Tryon	5.64	1.11	1.86	2.97	3.61	6.80				22.62
Brand claiming.													
4699	Southern Cotton Oil Co., Spartanburg, S. C.	Big Ear Corn Standard Fertilizer	Tryon	5.64	1.11	1.86	2.97	3.61	6.80				24.35

	Brand claiming		7.00		2.26	2.75	4.00		19.79
4479	Lenoir Oil and Ice Co., Kinston, N. C.	Sugg's Special Mixture	6.56	.21	2.04	2.25	2.74	4.18	19.53
	Brand claiming		7.00			2.26	2.75	6.00	21.79
4370	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Plant Bed High Grade Tobacco Fertilizer.	6.07	1.35	.50	1.85	2.25	5.36	18.68
	Brand claiming		7.00			2.55	3.10	3.20	20.21
4012	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Formula 44 for Bright Wrappers and Smokers.	7.74	2.12	.42	2.54	3.09	3.62	21.25
	Brand claiming		7.00			2.69	3.27	4.50	22.10
4018	Farmville Oil and Fertilizer Co., Farmville, N. C.	Lewis' Special Cotton Grower	7.75	.80	1.56	2.36	2.87	5.24	22.13
	Brands claiming		7.00			2.88	3.50	7.00	25.40
4823	Baugh & Sons Co., Norfolk, Va.	Baugh's Potato and Truck Special	7.17	2.15	.72	2.87	3.49	7.54	26.05
3504	do	Baugh's Southern States Guano for Bright Tobacco.	6.99	2.41	.60	3.01	3.66	7.14	26.07
5936	do	do	7.13	2.29	.56	2.85	3.46	6.98	25.37
3795	do	do	6.74	2.40	.56	2.96	3.60	6.86	25.36
3722	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Columbia Special Tobacco Fertilizer.	7.52	1.15	1.28	2.43	2.95	6.42	23.39
	Brand claiming		7.00			2.47	3.00	4.00	20.67
4746	American Fertilizer Co., Norfolk, Va.	Stable Manure Substitute.	7.22	2.25	.50	2.75	3.34	4.42	22.47
	Brand claiming		7.00			2.47	3.00	7.00	23.67
4897	Coe-Mortimer Co., Charleston, S. C.	Coe-Mortimer Co.'s Cotton Special	8.23	1.53	.78	2.31	2.81	6.04	23.15
	Brand claiming		7.00			2.47	3.00	10.00	26.67
4859	United States Fertilizer Co., Baltimore, Md.	Farm Bell Potato and Tobacco Guano Pleasant Garden.	6.91	1.33	1.04	2.37	2.88	10.04	26.21
	Brands claiming		7.00			3.29	4.00	4.00	24.12
3503	American Fertilizer Co., Norfolk, Va.	American Fish Scrap Guano.	6.69	3.11	.36	3.47	4.22	4.52	25.11
3801	Hadley-Harris Co., Wilson, N. C.	Harris' Java Tobacco Guano.	6.78	2.72	.68	3.40	2.92	6.88	27.26
	Brands claiming		7.00			3.29	4.00	5.00	25.12
6092	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union	7.07	2.45	.22	2.67	3.25	5.68	23.26
3574	Swift Fertilizer Works, Wilmington, N. C.	Swift's Special High Grade Guano.	8.92	1.30	1.70	3.00	3.65	4.90	25.53



4204	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters' Special Truck Fertilizer.....	Wadesboro.....	7.24	3.93	.60	4.53	5.51	3.76			29.30
5881	Pocomoke Guano Co., Norfolk, Va.....	Standard Truck Guano.....	Creswell.....	7.08	3.23	1.00	4.23	5.14	5.50			29.64
3614	do.....	do.....	Elizabeth City.....	7.17	3.11	1.00	4.11	5.00	5.08			28.79
4455	Robersonville Guano Co., Robersonville, N. C.	Roberson High Grade Truck Guano.....	Robersonville.....	7.00	1.79	1.94	3.73	4.53	5.68			27.85
3711	Royster, F. S., Guano Co., Norfolk, Va.....	Royal Potato Guano.....	Rokey Mount.....	6.97	3.05	1.58	4.65	5.65	4.48			30.28
3480	Swift Fertilizer Works, Wilmington, N. C.....	Swift's Early Truck High Grade Guano.....	Goldsboro.....	6.97	1.83	1.94	3.77	4.58	5.12			27.23
3871	Upshur, R. L., Guano Co., Norfolk, Va.....	Upshur's 5 Per Cent Guano.....	Creswell.....	6.94	2.97	.88	3.85	4.68	5.44			27.86
4025	Va.-Car. Chemical Co., Richmond, Va.....	V.-C. C. Co.'s None Equal High Grade Truck Fertilizer.....	Moorestville.....	7.31	3.28	.30	3.58	4.35	4.80			26.41
<b>Brand claiming</b>				7.00			4.11	5.00	6.00			29.56
3914	Upshur, R. L., Guano Co., Richmond, Va.....	Upshur's Farmers' Favorite.....	Goldsboro.....	7.55	2.94	1.02	3.96	4.81	6.48			29.91
<b>Brands claiming</b>				7.00			4.11	5.00	7.00			30.56
3491	Acme Mfg. Co., Wilmington, N. C.....	Acme Root Crop Guano.....	Mount Olive.....	6.77	2.33	1.40	3.73	4.53	8.18			29.94
4736	Navassa Guano Co., Wilmington, N. C.....	Root Crop Fertilizer.....	Wallace.....	7.91	2.39	.30	2.69	3.27	7.70			26.12
3621	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Ives' Irish Potato Guano.....	Everetts.....	7.16	2.13	1.14	3.27	3.98	8.62			28.80
4076	Pamlico Chemical Co., Washington, N. C.....	Pamlico Special Irish Potato Guano.....	Bayboro.....	6.82	2.70	1.50	4.20	5.11	7.04			30.82
4630	Va.-Car. Chemical Co., Richmond, Va.....	V.-C. C. Co.'s Truck Crop Fertilizer.....	Mount Olive.....	8.12	3.01	.88	3.89	4.73	6.76			30.41
3635	do.....	do.....	Wallace.....	8.24	3.79	.20	3.99	4.84	6.08			30.25
4463	do.....	do.....	Edenton.....	7.37	2.37	1.38	3.75	4.56	6.74			29.12
<b>Brands claiming</b>				7.00			4.11	5.00	8.00			31.56
4604	Armour Fertilizer Works, Wilmington, N. C.....	Armour's 7-5-8 Fertilizer.....	Clinton.....	6.69	2.23	1.40	3.63	4.41	8.40			29.67
3911	Farmers Guano Co., Raleigh, N. C.....	Farmers' 7-5-8 Special.....	Greensboro.....	7.39	3.18	.94	4.12	5.01	7.92			31.87
3577	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' Great Potato Guano.....	New Bern.....	6.69	1.81	2.12	2.93	3.56	7.50			25.83
3674	Va.-Car. Chemical Co., Richmond, Va.....	Old Dominion Guano Co.'s Potato Manure.....	Clinton.....	8.01	3.87	.38	4.25	5.17	7.26			32.32
<b>Brand claiming</b>				7.00			4.11	5.00	10.00			33.56
4234	Navassa Guano Co., Wilmington, N. C.....	Maulsby's Tobacco Special.....	Whiteville.....	7.72	3.93	.26	4.19	5.09	7.94		8.00	32.49



4225	do	do	Edenton	6.60	1.91	.54	2.45	2.98	7.30	1.04	6.26	.80	23.61
<b>Brands claiming</b>													
4822	Armour Fertilizer Works, Wilmington, N. C.	Armour's Manure Substitute.	Garland	6.00			3.29	4.00	4.00				23.22
4259	Carolina-Union Fertilizer Co., Norfolk, Va.	Carolina-Union 4-6-4.	Edenton	5.88	1.93	1.06	2.99	3.64	3.60				21.45
4176	Imperial Co., Norfolk, Va.	Imperial Fish and Bone	Edenton	6.64	1.93	1.04	2.97	3.61	4.34				22.79
3869	Royster, F. S., Guano Co., Norfolk, Va.	Oakley's Special Tobacco Guano	Edenton	5.51	2.37	.68	3.05	3.71	4.40				22.17
<b>Brands claiming</b>													
3878	Va.-Car. Chemical Co., Richmond, Va.	Butler's Special Mixture	Hoffman	6.22	.82	2.32	3.14	3.82	4.00	2.12	1.88	1.60	22.79
3944	Winborne Guano Co., Norfolk, Va.	Winborne's Tip Top Tobacco Guano	Edenton	6.00			3.29	4.00	5.00				24.22
<b>Brands claiming</b>													
3500	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Eureka Tobacco Fertilizer	Kinston	8.02	1.45	1.04	2.52	3.06	2.94				20.74
4145	Pamlico Chemical Co., Washington, N. C.	Pamlico 6-4-7 Guano	LaGrange	6.40	1.43	.92	2.35	2.86	4.92	4.92		6.50	20.55
4474	Va.-Car. Chemical Co., Richmond, Va.	Va.-Car. Chemical Co.'s 6-4-7 Tobacco Mixture	Fountain	6.00			3.29	4.00	7.00				26.22
<b>Brand claiming</b>													
3489	Acme Mfg. Co., Wilmington, N. C.	Acme Truck Guano	Mount Olive	7.22	1.29	1.84	3.13	3.81	6.84	6.84		10.20	26.48
<b>Brands claiming</b>													
3608	Imperial Co., Norfolk, Va.	Imperial Williams' Special Potato Guano	Elizabeth City	7.10	1.35	1.80	3.15	3.83	8.06				27.68
3615	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Special 5-6-5	Elizabeth City	5.29	2.79	.34	3.13	3.81	6.88			7.40	24.79
3617	Troutman Mfg. Co., Churehland, Va.	Troutman's 5 Per Cent Guano	Elizabeth City	6.00			3.29	4.00	8.00				29.66
4374	Young, J. R., Fertilizer Co., Norfolk, Va.	J. R. Young's Special Guano for Potatoes	Edenton	7.42	1.61	1.72	3.33	4.05	6.10				26.76
<b>Brands claiming</b>													
3690	American Fertilizer Co., Norfolk, Va.	Special Potato Mixture	Parkton	6.00			4.11	5.11	5.00				27.66
3473	Armour Fertilizer Works, Wilmington, N. C.	Armour's 5 Per Cent Truck	Manchester	6.17	3.49	.88	4.07	4.95	5.40				28.05
3611	Baugh & Sons Co., Norfolk, Va.	Baugh's Pernvian Substitute for Potatoes, etc.	Elizabeth City	5.39	2.39	1.30	3.69	4.49	5.08				25.43
3900	Carolina-Union Fertilizer Co., Norfolk, Va.	Carolina-Union 5-6-7	Elizabeth City	6.99	2.75	1.76	4.51	5.48	4.94				30.17
<b>Brands claiming</b>													
3690	American Fertilizer Co., Norfolk, Va.	Special Potato Mixture	Parkton	6.37	2.73	.62	3.35	4.07	5.02				24.82
3473	Armour Fertilizer Works, Wilmington, N. C.	Armour's 5 Per Cent Truck	Manchester	6.00			4.11	5.00	7.00				29.66
3611	Baugh & Sons Co., Norfolk, Va.	Baugh's Pernvian Substitute for Potatoes, etc.	Elizabeth City	6.23	4.85	.28	5.13	6.24	6.20				33.35
3900	Carolina-Union Fertilizer Co., Norfolk, Va.	Carolina-Union 5-6-7	Elizabeth City	5.80	1.97	1.66	3.63	4.41	6.26				26.73
<b>Brands claiming</b>													
3611	Baugh & Sons Co., Norfolk, Va.	Baugh's Pernvian Substitute for Potatoes, etc.	Elizabeth City	6.12	3.47	.70	4.17	5.07	7.60				30.62
3900	Carolina-Union Fertilizer Co., Norfolk, Va.	Carolina-Union 5-6-7	Elizabeth City	6.82	2.75	1.36	4.11	5.00	5.54				28.94

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.							Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Potash from Muriate.	Sulphate.		Chlorine.
MIXED FERTILIZERS.												
Brands claiming												
3855	Columbia Guano Co., Norfolk, Va.	Columbia Irish Potato Guano	Elizabeth City	6.00	—	—	4.11	5.00	7.00	—	—	\$29.66
3555	Eastern Cotton Oil Co., Hertford, N. C.	Columbia	Columbia	6.28	3.16	.92	4.08	4.96	7.00	—	—	29.79
6034	Grandy, N. G., & Co., Elizabeth City, N. C.	Nun-Such Potato Grower.	Elizabeth City	6.30	2.37	1.46	3.83	4.66	7.60	—	—	29.36
5886	do.	Grandy's 5-6-7 Potato Guano.	Elizabeth City	6.68	3.26	1.08	4.34	5.28	6.94	—	—	31.18
3607	Imperial Co., Norfolk, Va.	do.	Elizabeth City	6.09	3.37	.66	4.03	4.90	8.42	—	—	30.83
3610	Martin Fertilizer Co., Norfolk, Va.	Imperial 5-6-7 Potato Guano.	Elizabeth City	6.13	3.23	.88	4.11	5.00	7.76	—	—	30.54
3721	Navassa Guano Co., Wilmington, N. C.	Martin's Animal Bone Potato Guano.	Elizabeth City	5.57	2.59	.90	3.49	4.24	8.58	—	—	28.25
3542	Patapasco Guano Co., Baltimore, Md.	Navassa Creole Guano.	Chadbourn	8.25	2.77	.30	3.07	3.73	6.08	—	—	26.40
4099	Phillips, F. T., Washington, N. C.	Patapasco Potato Guano.	Kings Mountain	9.20	3.17	.72	3.89	4.73	8.58	—	—	33.20
3856	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Phillips' High Grade Guano for Potatoes and All Vegetables.	Washington	6.77	1.66	2.18	3.84	4.67	9.12	—	—	31.34
3561	Robertson Fertilizer Co., Norfolk, Va.	Piedmont Early Vegetable Manure.	Elizabeth City	6.45	2.32	1.56	3.88	4.72	6.94	—	—	29.04
3616	Royster, F. S., Guano Co., Norfolk, Va.	Robertson's 5-6-7 Guano.	Columbia	6.19	1.94	1.78	3.72	4.52	7.90	—	—	29.09
4166	do.	Royster's Irish Potato Guano.	Elizabeth City	6.04	2.83	1.28	4.11	5.00	7.04	—	—	29.74
5925	Va.-Car. Chemical Co., Richmond, Va.	Yellow Back Sweet Potato Guano	Elizabeth City	6.10	3.77	1.28	5.05	6.14	7.08	—	—	33.78
4150	do.	V.-C. C. Co.'s Invincible.	Elizabeth City	6.23	3.40	.50	3.90	4.74	6.20	—	—	38.19
3546	do.	do.	Kinston	6.59	3.15	.60	3.75	4.56	7.22	—	—	28.90
	do.	V.-C. C. Co.'s Special Truck Guano	Brevard	6.40	4.37	.30	4.67	5.68	8.68	—	—	34.05



## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.								Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.		Chlorine.
MIXED FERTILIZERS.													
Brand claiming				3.00			8.23	10.00	4.00				\$41.27
4602	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh Top Dresser	Raleigh	3.63	3.04	2.17	6.21	7.55	3.99				33.34
Brand claiming				2.00			8.23	10.00	5.00				41.37
4792	Farmers Cotton Oil Co., Wilson, N. C.	Perfect Top Dresser	Wilson	1.81	7.63	.10	7.73	9.40	4.64				38.73
Brand claiming				2.00			7.29	8.86	5.00				37.42
5888	McNair Phosphate Co., Laurinburg, N. C.	Sodash	Lane	2.17	6.67	1.02	7.59	9.23	5.88				39.71
Brand claiming				8.50			5.74	6.98					30.91
3954	City of Winston-Salem, N. C.	Tankage	Winston-Salem	9.63	1.30	4.10	5.40	6.57					30.38
Brand claiming							9.87	12.00	2.00				41.45
4783	Hadley-Harris Co., Wilson, N. C.	Harris Nitrolite Top Dressing	Baileys		8.60	.54	9.14	11.11	1.90				38.02
Brand claiming							9.87	12.00	5.00				46.45
4325	Powhatan Chemical Co., Richmond, Va.	Tomlinson's Nitrate-Muriate Special	Wilson		8.41	.76	9.17	11.15	5.84				44.35
Brands claiming				4.50			7.81	9.50					36.85
3496	Acme Mfg Co., Wilmington, N. C.	Dried Ground Fish	Wilmington	4.40	2.98	4.42	7.40	9.00					35.04
4614	do	do	Samarcand	4.61	2.57	4.50	7.07	8.60					33.84
Brand claiming				3.00			8.23	10.00					37.22
4190	Royster, F. S., Guano Co., Norfolk, Va	Royster's Ground Fish Scrap	Speed	6.41	.50	7.02	7.52	9.14					37.35

Brands claiming																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			</
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## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.								Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Potash.	Potash from Muriate.	Potash from Sulphate.		Chlorine.
MIXED FERTILIZERS.													
Brands claiming.....													
4263	American Fertilizer Co., Norfolk, Va.....	Dissolved Bone and Potash for Corn and Wheat.	Edenton.....	10.00					2.00				\$11.00
4393	Armour Fertilizer Works, Greensboro, N. C.....	Armour's Phosphate and Potash No. 1 Fertilizer.	Bryson City.....	9.67					2.04				10.74
3955	do.....	do.....	Winston-Salem.....	10.29					1.66				10.92
3683	do.....	do.....	Mail.....	9.66					1.94				10.63
4527	Baugh & Sons Co., Philadelphia, Pa.....	Baugh's Soluble Alkaline Superphosphate.	Randleman.....	9.97					1.58				10.55
4227	Columbia Guano Co., Norfolk, Va.....	Columbia Bone and Potash Mixture	Edenton.....	10.54					2.14				11.63
4562	do.....	do.....	Edenton.....	9.51					5.06				12.61
3957	Coöperative Warehouse Co., Salisbury, N. C.....	Farmers' Union 10-2 Bone and Potash	Craggy.....	10.01					1.88				10.89
4217	Craven Chemical Co., New Bern, N. C.....	C. E. Foy's High Grade Bone and Potash.	Winston-Salem.....	10.88					2.20				11.99
5929	Eastern Cotton Oil Co., Hertford, N. C.....	Bone and Potash.	Kellum.....	10.59					6.56				16.09
3860	do.....	do.....	Elizabeth City.....	10.24					1.90				11.12
4638	Farmers Cotton Oil Co., Wilson, N. C.....	do.....	Elizabeth City.....	10.12					1.58				10.69
4669	Farmers Guano Co., Norfolk, Va.....	Xtra Good Bone and Potash	Stantonsburg.....	10.02					5.64				14.66
4863	Georgia Chemical Works, Augusta, Ga.....	Century Bone and Potash Mixture	Mocksville.....	10.29					2.80				12.06
4685	Imperial Co., Norfolk, Va.....	Bone and Potash.	Bennett.....	10.11					1.88				10.98
4549	Lister Agricultural Chemical Works, Newark, N. J.....	Imperial Bone and Potash.	Mebane.....	10.29					2.24				11.50
		Lister's Dissolved Phosphate and Potash.	Stony Point.....	10.32					3.92				13.21

4252	Navassa Guano Co., Wilmington, N. C.	Navassa Dissolved Bone with Potash.	Maysville.	10.31	2.12	11.40
4254	do	Navassa Piedmont Wheat Grower	Statesville	9.71	2.02	10.76
4253	Old Buck Guano Co., Richmond, Va.	Old Buck Hartford Bone and Potash.	Ulah	9.45	2.54	11.04
4252	Patapasco Guano Co., Baltimore, Md.	Patapasco Soluble Bone and Potash.	Scotts	11.96	2.40	13.16
3682	Pocomoke Guano Co., Norfolk, Va.	10-2 Potash Mixture.	Maiden	10.36	2.22	11.54
3796	Richmond Guano Co., Richmond, Va.	Bone and Potash.	Mocksville	10.35	2.04	11.35
3661	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Bone and Potash Mixture.	Hickory	9.94	2.30	11.25
4723	do	F. S. Royster's 10 and 2 Bone and Potash Mixture.	Hendersonville.	9.72	2.14	10.89
4832	Spartanburg Fertilizer Co., Spartanburg, S. C.	Tiger Brand.	Hendersonville.	9.66	2.06	10.75
4423	Swift Fertilizer Works, Atlanta, Ga.	Swift's Field and Farm Standard Guano, Phosphate and Potash.	Bryson City	9.45	2.00	10.50
6030	Union Guano Co., Winston, N. C.	Union 10 and 2 Bone and Potash.	Cleveland	10.86	1.68	11.45
3981	Va.-Car. Chemical Co., Richmond, Va.	A. & A.'s Bone and Potash Mixture.	Hendersonville.	10.94	2.90	12.75
3773	do	Davie & Whittle's Owl Brand Acid Phosphate with Potash.	Hillsboro.	10.23	1.34	10.55
3645	do	Durham Fertilizer Co.'s Blue Ridge Wheat Grower.	Statesville	9.84	1.96	10.82
4027	do	Durham Fertilizer Co.'s Standard Wheat Grower.	Statesville	9.53	1.84	10.22
3887	do	Lynchburg Guaranteed Dissolved Bone and Potash.	Elkin.	10.60	2.36	11.90
4655	do	Norfolk and Carolina Chemical Co.'s Bone and Potash.	Graves Siding	10.05	2.20	11.24
4026	do	Old Dominion Guano Co.'s Alkaline Bone.	Mooreville.	10.09	2.02	11.10
3646	do	Southern Chemical Co.'s Mammoth Corn Grower.	Statesville	9.70	1.80	10.53
4289	do	Tinsley & Co.'s Bone and Potash Mixture.	Graham	10.10	1.58	10.67
4358	do	Travers & Co.'s Capital Bone and Potash Compound.	Hominy	10.46	3.02	12.43
4341	do	V.-C. C. Co.'s Special Potash Mixture.	Rutherfordton	11.03	2.14	12.05
3888	Winborne Guano Co., Norfolk, Va.	Union Bone and Potash.	Elkin.	10.83	2.54	12.29
4464	do	Winborne's Soluble Bone and Potash.	Edenton.	10.20	2.36	11.54
4379	Young, J. R., Fertilizer Co., Norfolk, Va.	J. R. Young's Bone and Potash Guano.	Edenton.	8.64	1.96	9.74



4703	.....do.....	Columbia 10 and 4 Bone and Potash Mixture.....	Clyde.....	9.83	.....	.....	.....	.....	.....	12.57
3956	Coöperative Warehouse Co., Salisbury, N.C.	Farmers' Union 10-4 Bone and Potash.....	Winston-Salem.....	10.82	.....	.....	.....	.....	.....	13.28
4774	Coweta Fertilizer Co., Newnan, Ga.	Coweta Standard Bone and Potash.....	Southmont.....	9.98	.....	.....	.....	.....	.....	12.86
4269	Craven Chemical Co., New Bern, N. C.	Craven Grain Compound.....	Eves Siding.....	9.22	.....	.....	.....	.....	.....	11.88
3861	Dixie Guano Co., Suffolk, Va.	Dixie Alkaline Bone and Potash.....	Edenton.....	10.05	.....	.....	.....	.....	.....	12.90
3797	Georgia Chemical Works, Augusta, Ga.	High Grade XX Acid Phosphate with Potash.....	Greensboro.....	10.24	.....	.....	.....	.....	.....	12.54
3592	.....do.....	.....do.....	Greensboro.....	10.62	.....	.....	.....	.....	.....	12.70
4684	Imperial Co., Norfolk, Va.	Catawba Wheat Grower.....	Mebane.....	10.04	.....	.....	.....	.....	.....	12.94
4492	Marietta Fertilizer Co., Atlanta, Ga.	Marietta Potash Special.....	Coats.....	9.90	.....	.....	.....	.....	.....	13.67
3895	Miller Fertilizer Co., Baltimore, Md.	Miller Fertilizer Co.'s 10 and 4 Per Cent.....	High Point.....	9.95	.....	.....	.....	.....	.....	13.73
4218	Navassa Guano Co., Wilmington, N. C.	Navassa Dissolved Bone with Potash.....	Kellum.....	11.72	.....	.....	.....	.....	.....	13.75
4551	.....do.....	Navassa Wheat and Grass Grower.....	Hiddenite.....	10.56	.....	.....	.....	.....	.....	13.12
3894	Norfolk Fertilizer Co., Norfolk, Va.	Oriana Wheat Grower.....	High Point.....	10.25	.....	.....	.....	.....	.....	13.46
3926	Old Buck Guano Co., Richmond, Va.	Old Buck German 10 and 4 Mixture.....	Landis.....	9.54	.....	.....	.....	.....	.....	12.97
3543	Patapasco Guano Co., Baltimore, Md.	Patapasco 10-4 Potash Mixture.....	Kings Mountain.....	10.14	.....	.....	.....	.....	.....	13.03
4810	Poehontas Guano Co., Norfolk, Va.	Wabash Wheat Mixture.....	Millboro.....	9.86	.....	.....	.....	.....	.....	12.97
4553	.....do.....	Pocomoke Bone and Potash Mixture.....	Stony Point.....	9.67	.....	.....	.....	.....	.....	13.18
3784	Powhatan Chemical Co., Richmond, Va.	Magic Bone and Potash Mixture.....	Waco.....	10.22	.....	.....	.....	.....	.....	13.06
4754	Reidsville Fertilizer Co., Reidsville, N. C.	Bone and Potash.....	Crutchfield.....	10.40	.....	.....	.....	.....	.....	14.42
3783	Richmond Guano Co., Richmond, Va.	Rex Bone and Potash Mixture.....	Cherryville.....	11.50	.....	.....	.....	.....	.....	13.27
4305	Robertson Fertilizer Co., Norfolk, Va.	Skyscraper Bone and Potash Compound.....	Ellenboro.....	9.70	.....	.....	.....	.....	.....	12.73
3681	Royster, F. S., Guano Co., Norfolk, Va.	Royster's 10-4 Bone and Potash Mixture.....	Lincolnton.....	10.22	.....	.....	.....	.....	.....	13.10
4306	Southern Cotton Oil Co., Charlotte, N. C.	Conqueror B. P. High Grade Bone and Potash.....	Lattimore.....	9.42	.....	.....	.....	.....	.....	11.84
4704	Southern Cotton Oil Co., Spartanburg, S. C.	Quick Step High Grade Acid with Potash.....	Tryon.....	9.38	.....	.....	.....	.....	.....	13.22
4724	Spartanburg Fertilizer Co., Spartanburg, S. C.	Tiger Brand 10 and 4.....	Hendersonville.....	9.78	.....	.....	.....	.....	.....	12.82
3660	Swift Fertilizer Works, Atlanta, Ga.	Swift's Farmers' Home High Grade Phosphate and Potash.....	Conover.....	10.57	.....	.....	.....	.....	.....	12.43

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.								Relative Value per Ton at Factory.	
				*Available Phosphate Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.		Chlorine.
MIXED FERTILIZERS.													
Brands claiming													
3893	Swift's Fertilizer Works, Atlanta, Ga.	Swift's Farmer's Home High Grade Phosphate and Potash.	High Point.	10.00						4.00			\$13.00
3659	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Acid and Potash.	Newton.	9.29						4.70			13.06
5950	.....do.....	.....do.....	Lincolnton.	9.60						3.50			12.14
6097	Union Guano Co., Winston, N. C.	Quaker Grain Mixture.	Greensboro.	9.85						3.14			12.00
4441	.....do.....	.....do.....	Catawba.	8.97						6.04			14.10
4611	.....do.....	Union 10-4 Bone and Potash.	Clinton.	10.27						4.30			13.54
4649	United States Fertilizer Co., Baltimore, Md.	Farm Bell Special Mixture.	Edenton.	10.54						3.40			12.89
4593	.....do.....	.....do.....	Statesville.	10.79						3.90			13.61
4755	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Bone and Potash Mixture.	Mocksville.	10.13						4.30			13.42
3551	.....do.....	Lynchburg Guano Co.'s S. W. Special Bone and Potash Mixture.	Asheville.	9.90						2.86			11.77
4518	.....do.....	.....do.....	Troy.	10.57						3.04			12.54
4115	.....do.....	Southern Chemical Co.'s Winner Grain Mixture.	Durham.	9.30						3.98			12.35
4063	.....do.....	Va. State Fertilizer Co.'s XX Potash Mixture.	Tooeane.	9.94						3.72			12.67
3591	.....do.....	V.-C. C. Co.'s Special Potash Mixture.	Burlington.	8.33						4.94			12.44
Brand claiming.				10.80						3.28			13.00
				10.00						5.00			14.00
4161	Contentnea Guano Co., Wilson, N. C.	Bone and Potash Mixture, No. 3.	Four Oaks.	10.35						4.36			13.67

4290	Royster, F. S., Guano Co., Norfolk, Va.....	Royster's Bone and Potash Mixture.....	Kernersville.....	9.51	4.34	12.90
4011	Va.-Car. Chemical Co., Richmond, Va.....	V.-C. C. Co.'s Standard Bone and Potash.....	Benson.....	10.48	4.12	13.55
3550	-----do-----	Va. State Fertilizer Co.'s Mountain Top Bone and Potash.....	Asheville.....	9.96	4.80	13.76
	<b>Brands claiming</b> .....			10.00	6.00	15.00
4064	Asheville Packing Co., Asheville, N. C.....	Asheville Packing Co.'s Superior Potash Fertilizer.....	Asheville.....	10.50	4.50	13.95
4830	Va.-Car. Chemical Co., Richmond, Va.....	V.-C. C. Co.'s Grain Special.....	Waynesville.....	11.26	5.08	15.21
4561	-----do-----	-----do-----	Waynesville.....	11.09	5.22	15.20
	<b>Brand claiming</b> .....			10.00	8.00	17.00
4831	Va.-Car. Chemical Co., Richmond, Va.....	V.-C. C. Co.'s Buyers' Mixture.....	Waynesville.....	7.46	10.76	17.47
	<b>Brand claiming</b> .....			10.50	1.50	10.95
4808	Va.-Car. Chemical Co., Richmond, Va.....	Durham Fertilizer Co.'s Great Wheat and Corn Grower.....	Julian.....	10.57	1.56	11.07
	<b>Brands claiming</b> .....			11.00	5.00	14.90
4851	Armour Fertilizer Works, Greensboro, N. C.....	Armour's Sampson Corn Mixture.....	Asheville.....	9.93	4.76	13.70
4450	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.....	Horne & Sons' H. G. Bone and Potash.....	Raleigh.....	11.64	5.18	15.66
4096	Va.-Car. Chemical Co., Richmond, Va.....	Southern Chemical Co.'s Quickstep Bone and Potash.....	Raleigh.....	10.44	4.08	13.48
	<b>Brand claiming</b> .....			12.00	3.06	13.80
4369	Coöperative Warehouse Co., Salisbury, N. C.....	Farmers' Union Bone and Potash.....	Salisbury.....	12.65	2.60	13.98
	<b>Brand claiming</b> .....			12.00	5.00	15.80
4861	Royster, F. S., Guano Co., Norfolk, Va.....	Royster's Bone and Potash Mixture.....	Pleasant Garden.....	12.35	4.58	15.69
	<b>Brands claiming</b> .....			12.00	6.00	16.80
4862	Georgia Chemical Works, Augusta, Ga.....	Georgia Bone and Potash.....	Bennett.....	10.44	5.90	15.30
4550	Navassa Guano Co., Wilmington, N. C.....	Navassa Wheat Belt Special.....	Hiddenite.....	11.30	5.12	15.29
	<b>Brand claiming</b> .....			13.00	4.00	15.70
4357	Adair, A. D., & McCarty Bros., Atlanta, Ga.....	A. & M. 13-4.....	Franklin.....	13.02	3.60	15.32
	<b>Brand claiming</b> .....			20.00	12.00	30.00
6028	Union Guano Co., Winston, N. C.....	Special Mixture.....	Ether.....	20.39	10.24	28.59

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.								Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.		Chlorine.
RAW OR UNMIXED FERTILIZER MATERIALS.													
	Brand claiming			12.00									\$ 9.60
4028	Va.-Car. Chemical Co., Richmond, Va.	Old Dominion Guano Co.'s Royster's Acid Phosphate.	Mooreville.	12.00									9.60
	Brands claiming			13.00									10.40
4670	Farmers Guano Co., Norfolk, Va.	Acid Phosphate.	Mocksville.	15.26									12.21
3798	Richmond Guano Co., Richmond, Va.	Premium Dissolved Bone	Mocksville.	13.51									10.81
3799	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Dissolved Bone	Mocksville.	13.50									10.80
4395	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's I.X.L. Acid Phosphate.	Clyde.	14.46									11.57
4776	do	Davie & Whittle's Owl Brand Acid Phosphate.	Newsoms.	15.57									12.46
	Brands claiming			14.00									11.20
4208	American Agricultural Chemical Co., New York, N. Y.	Zell's 14 Per Cent Acid Phosphate.	Polkton.	13.14									10.51
4656	American Fertilizer Co., Norfolk, Va.	High Grade Acid Phosphate.	Seagrove.	15.52									12.42
3684	Armour Fertilizer Works, Greensboro, N. C.	Armour Acid Phosphate.	Maiden.	13.93									11.14
4396	do	Armour's Star Phosphate Fertilizer.	Bryson City.	14.72									11.78
4228	Columbia Guano Co., Norfolk, Va.	Columbia 14 Per Cent Acid Phosphate	Edenton.	14.54									11.63
4775	Coweta Fertilizer Co., Newman, Ga.	Coweta High Grade Acid Phosphate.	Southmont.	14.84									11.87
4219	Craven Chemical Co., New Bern, N. C.	Jewel Acid Phosphate.	Kellum.	15.09									12.07
4284	Farmers Guano Co., Raleigh, N. C.	14 Per Cent Acid Phosphate.	Edenton.	15.03									12.02

4264	Imperial Co., The, Norfolk, Va.	Imperial High Grade Acid Phosphate.	Edenton.	14.13	11.30
3697	McNair Phosphate Co., Louisburg, N. C.	Acid Phosphate.	Red Springs.	14.55	11.64
4427	Navassa Guano Co., Wilmington, N. C.	Navassa Acid Phosphate.	Lexington.	13.65	10.92
4657	Old Buck Guano Co., Richmond, Va.	Old Buck 14 Per Cent Acid Phosphate.	Seagrove.	15.70	12.56
3832	Planter Fertilizer Co., Charleston, S. C.	Planters' High Grade Acid Phosphate.	Wadesboro.	15.04	12.03
3685	Pocomoke Guano Co., Norfolk, Va.	Peerless Acid Phosphate.	Maiden.	14.17	11.34
4126	Richmond Guano Co., Richmond, Va.	High Grade Acid Phosphate.	Shelby.	14.28	11.42
6015	do.	do.	Eagle Springs.	14.21	11.37
3989	Royster, F. S., Guano Co., Norfolk, Va.	Royster's 14 Per Cent Acid Phosphate.	Warrenton.	16.09	12.87
5951	Southern Cotton Oil Co., Fayetteville, N. C.	S. C. O. Co.'s 14 Per Cent Acid Phosphate.	Fayetteville.	16.74	13.39
5952	do.	do.	Fayetteville.	16.64	13.31
3695	Southern Cotton Oil Co., Goldsboro, N. C.	do.	Red Springs.	15.90	12.72
4424	Swift Fertilizer Works, Wilmington, N. C.	Swift's Cultivator High Grade Acid Phosphate.	Biltmore.	16.20	12.96
4803	Tuscarora Fertilizer Co., Greensboro, N. C.	Acid Phosphate.	Faith.	15.05	12.04
4658	Union Guano Co., Winston-Salem, N. C.	Union High Grade Acid Phosphate.	Ether.	15.62	12.50
4343	Va.-Car. Chemical Co., Richmond, Va.	A. & A.'s Fulton Acid Phosphate.	Lenoir.	14.73	11.78
4659	do.	Southern Chemical Co.'s Red Cross 14 Per Cent Acid Phosphate.	Ulah.	14.02	11.22
4519	do.	J. G. Tinsley & Co.'s Powhatan Acid Phosphate.	Troy.	16.47	13.18
4328	do.	V.-C. C. Co.'s 14 Per Cent Acid Phosphate.	Lilesville.	15.27	12.27
<b>Brands claiming</b>				<b>16.00</b>	<b>12.80</b>
4330	Acme Mfg. Co., Wilmington, N. C.	16 Per Cent Acid Phosphate.	Ansonville.	16.62	13.30
3754	do.	do.	Raeford.	16.46	13.17
4804	American Agricultural Chemical Co., New York, N. Y.	Detrick's 16 Per Cent Acid Phosphate.	Landis.	16.77	13.42
4597	do.	Lazaretto 16 Per Cent Acid Phosphate.	Moorestville.	16.51	13.21
3788	do.	Zell's 16 Per Cent Acid Phosphate.	Dallas.	16.54	13.23
3941	American Fertilizer Co., Norfolk, Va.	American High Grade Acid Phosphate.	Wake Forest.	16.25	13.00

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.							Relative Value per Ton at Factory.		
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.		Sulphate.	Chlorine.
RAW OR UNMIXED FERTILIZER MATERIALS.													
	<b>Brands claiming</b>			16.00								\$12.80	
3545	Armour Fertilizer Works, Greensboro, N. C.	Armour's 16 Per Cent Acid Phosphate Fertilizer.	Gastonia	15.57								12.46	
3745	Arps, George L., & Co., Norfolk, Va.	Arps' High Grade 16 Per Cent.	Edenton	16.23								12.98	
4271	Atlantic Chemical Co., Charlotte, N. C.	Atlantic High Grade 16 Per Cent Acid Phosphate.	Evans Siding	15.91								12.73	
6067	Atlantic Chemical Co., Norfolk, Va.	Atlantic High Grade 16 Per Cent Acid Phosphate.	Dusetta	18.12								14.50	
4581	Atlantic Fertilizer Works, Wilmington, N. C.	Atlantic Acid Phosphate, 16 Per Cent Rockingham High Grade.	Dusetta	15.85								12.68	
3714	Baugh & Sons Co., Philadelphia, Pa.	Baugh's 16 Per Cent Acid Phosphate.	Tabor	16.79								13.43	
4199	Berkley Chemical Co., Norfolk, Va.	Resolute Acid Phosphate.	Waxhaw	16.39								13.11	
4833	Beta Fertilizer Co., Beta, N. C.	16 Per Cent Acid Phosphate.	Beta	16.01								12.81	
3562	Boney, Paisley, Goldsboro, N. C.	High Grade Acid Phosphate.	Edenton	16.41								13.13	
4240	Bryant Fertilizer Co., Alexandria, Va.	Bryant's Acid Phosphate.	Lumberton	16.35								13.08	
4428	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	16 Per Cent Acid Phosphate.	Lexington	15.20								12.16	
3904	Carolina Union Fertilizer Co., Norfolk, Va.	Carolina Union 16 Per Cent.	Edenton	17.40								13.92	
4671	do.	do.	Mocksville	17.12								13.70	
5857	Chesapeake Chemical Co., Baltimore, Md.	C. C. Co.'s Dissolved Phosphate 16 Per Cent.	Windor	15.85								12.68	
4302	Coe-Mortimer Co., Charleston, S. C.	Coe-Mortimer's Dissolved Bone.	Hildebran	16.37								13.10	
3664	Columbia Guano Co., Norfolk, Va.	Columbia High Grade 16 Per Cent Acid Phosphate.	Conover	16.49								13.19	

3834	Combabee Fertilizer Co., Charleston, S. C.	Combabee 16 Per Cent Dissolved Bone Morven	16.91	13.53
3523	Conestee Chemical Co., Wilmington, N. C.	16 Per Cent Acid Phosphate	17.62	14.10
3687	Contentnea Guano Co., Wilson, N. C.	High Grade 16 Per Cent Acid Phosphate	17.20	13.76
3945	Cooperative Warehouse Co., Salisbury, N. C.	Farmers' Union 16 Per Cent Acid Phosphate	15.41	12.33
4200	Coweta Fertilizer Co., Newnan, Ga.	Coweta 16 Per Cent Acid Phosphate	16.44	13.15
4482	Craven Chemical Co., New Bern, N. C.	Craven Chemical Co.'s Panama Acid Phosphate, 16 Per Cent	16.05	12.84
3567	Crow Bros., Monroe, N. C.	Crow's High Grade 16 Per Cent Acid	16.42	13.14
3862	Dixie Guano Co., Suffolk, Va.	Dixie Acid Phosphate	16.50	13.20
3743	Eastern Cotton Oil Co., Hertford, N. C.	16 Per Cent Acid Phosphate	16.32	13.06
4329	Etiwan Fertilizer Co., Charleston, S. C.	Etiwan 16 Per Cent Acid Phosphate	15.45	12.36
3812	Farmers Cotton Oil Co., Wilson, N. C.	Acid Phosphate	16.49	13.19
4229	Farmers Guano Co., Raleigh, N. C.	16 Per Cent Acid Phosphate	16.22	12.98
3825	Farmers Supply Co., Edenton, N. C.	Standard 16 Per Cent Acid Phosphate	16.50	13.20
3744	Foreign Products Co., Baltimore, Md.	High Grade Acid Phosphate	16.37	13.10
6057	Foreign Products Co., Wilmington, N. C.	do	17.01	13.61
6021	do	do	16.50	13.20
4870	Fremont Oil Mill Co., Fremont, N. C.	16 Per Cent Acid Phosphate	15.21	12.13
4201	Georgia Chemical Works, Augusta, Ga.	Georgia High Grade Dissolved Bone Phosphate	16.71	13.37
6031	Grandy, N. G., & Co., Elizabeth City, N. C.	Grandy's High Grade 16 Per Cent Acid Phosphate	16.15	12.92
5887	do	do	15.72	12.58
4448	Hampton Guano Co., Norfolk, Va.	Supreme Acid Phosphate	16.79	13.43
4244	Imperial Co., Norfolk, Va.	Imperial High Grade Tennessee Acid Phosphate	16.97	13.58
3787	Interstate Chemical Co., Charlotte, N. C.	Acid Phosphate	15.85	12.68
4678	Johnston Bros., Charlotte, N. C.	do	16.42	13.14
4481	Josey, N. B., Guano Co., Tarboro, N. C.	Josey's 16 Per Cent Acid Phosphate	15.74	12.59
6106	Marietta Fertilizer Co., Greensboro, N. C.	Marietta High Grade Acid Phosphate	16.32	13.05

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.							Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Potash.	Potash from Muriate.		Potash from Sulphate.
RAW OR UNMIXED FERTILIZER MATERIALS.												
Brands claiming												
4245	Martin Fertilizer Co., Norfolk, Va.	Martin's Acid Phosphate.	Elizabeth City.	16.00								\$12.80
4030	do.	Martin's Bull Head Acid Phosphate.	Mooreville.	16.07								12.86
4501	McCarthy Bros., Chattanooga, Tenn.	Adair's High Grade Dissolved Bone.	Toecane.	16.34								13.07
3696	McNair Phosphate Co., Laurinburg, N. C.	Acid Phosphate	Red Springs	15.82								12.66
3939	Miller Fertilizer Co., Baltimore, Md.	do.	Wake Forest	16.43								13.14
3675	Navassa Guano Co., Wilmington, N. C.	Navassa 16 Per Cent Acid Phosphate	Clinton.	16.09								12.87
5988	do.	do.	Fayetteville.	16.18								12.94
3764	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	16 Per Cent Acid Phosphate	New Bern.	16.05								12.84
6070	do.	do.	New Bern.	16.28								13.02
3818	Nitrate Agencies Co., Norfolk, Va.	Acid Phosphate	Edenton.	16.27								13.02
6022	do.	do.	Scotland Neck.	16.49								13.19
5893	do.	High Grade Acid Phosphate.	Fayetteville.	16.82								13.46
5980	do.	do.	Duke.	16.47								13.18
3896	Norfolk Fertilizer Co., Norfolk, Va.	Oriana 16 Per Cent Acid Phosphate.	High Point.	17.10								13.68
4054	N. C. Cotton Oil Co., Wilmington, N. C.	High Grade 16 Per Cent Acid Phosphate.	Scotland Neck.	15.85								12.68
4035	Old Buck Guano Co., Richmond, Va.	Old Buck 16 Per Cent Acid Phosphate.	Norwood.	16.20								12.96
				16.04								12.83

4078	Pamlico Chemical Co., Washington, N. C.	Pamlico 16 Per Cent Acid Phosphate.	Bayboro.	16.54			13.23
3544	PatapSCO Guano Co., Baltimore, Md.	Florida Soluble Phosphate.	Kings Mountain.	16.19			12.95
3638	Pearsall & Co., Wilmington, N. C.	Pearsall's 16 Per Cent Acid Phosphate.	Wallace.	16.56			13.25
4102	Phillips, F. T., Washington, N. C.	High Grade 16 Per Cent Acid Phosphate.	Washington.	16.12			12.90
3880	Phosphate Mining Co., Savannah, Ga.	Superfine Acid Phosphate, High Grade.	Roekingham.	16.75			13.40
5012	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont 16 Per Cent Acid Phosphate.	Belhaven.	15.97			12.78
4740	Planters Cotton Oil and Fertilizer Co., Rocky Mount, N. C.	Acid Phosphate.	Pinetop.	17.46			13.97
6027	Planters Fertilizer and Phosphate Co., Charleston, S. C.	16 Per Cent Acid Phosphate.	Candor.	17.00			13.60
3833	Pocomoke Guano Co., Norfolk, Va.	Planters' 16 Per Cent Acid Phosphate.	Morven.	16.20			12.96
3856	-----do-----	Superb Acid Phosphate, 16 Per Cent.	Maiden.	17.22			13.78
4615	-----do-----	-----do-----	Glendon.	17.10			13.68
3786	Powlhatan Chemical Co., Richmond, Va.	Magic Dissolved Bone Phosphate.	Waco.	17.00			13.60
3570	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont 16 Per Cent Acid Phosphate.	Monroe.	16.03			12.82
4331	Read Phosphate Co., Charleston, S. C.	Read's High Grade Dissolved Bone.	Morven.	17.09			13.67
3785	Richmond Guano Co., Richmond, Va.	Rex Dissolved Bone.	Cherryville.	16.59			13.27
4171	Robertson Fertilizer Co., Norfolk, Va.	High Grade Acid Phosphate.	Edenton.	15.70			12.56
4679	Rock Hill Fertilizer Co., Rock Hill, S. C.	-----do-----	Pineville.	15.98			12.78
3900	Royster, F. S., Guano Co., Norfolk, Va.	Royster's High Grade Acid Phosphate.	Mocksville.	15.18			12.14
5933	Scotland Neck Guano Co., Scotland Neck, N. C.	Our 16 Per Cent Acid Phosphate.	Hookerton.	15.89			12.71
4094	Southern Cotton Oil Co., Charlotte, N. C.	Southern Cotton Oil Co.'s 16 Per Cent Acid Phosphate.	Venable.	16.10			12.88
4141	Southern Cotton Oil Co., Goldsboro, N. C.	-----do-----	Enfield.	16.91			13.53
4725	Spartanburg Fertilizer Co., Spartanburg, S. C.	Tiger Brand, 16 Per Cent.	Hendersonville.	15.52			12.42
4624	Swift Fertilizer Works, Atlanta, Ga.	Atlantic Acid Phosphate, 16 Per Cent High Grade.	Mooreville.	16.42			13.10
3483	-----do-----	Swift's Special High Grade Acid Phosphate.	Goldsboro.	16.60			13.28
3663	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Acid Phosphate.	Newton.	16.05			12.84
4065	-----do-----	-----do-----	Black Mountain.	16.86			13.49

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.						Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.		Potash from Muriate.
RAW OR UNMIXED FERTILIZER MATERIALS.											
Brands claiming											
4317	Upshur, R. L., Guano Co., Norfolk, Va.	16 Per Cent Acid Phosphate.	Autryville	16.00							\$12.80
3522	Union Guano Co., Winston, N. C.	Union 16 Per Cent Acid Phosphate.	Wadesboro	16.07							12.86
4101	United States Fertilizer Co., Baltimore, Md.	Farm Bell Acid Phosphate.	Washington	16.82							13.46
4715	Vance Guano Co., Henderson, N. C.	Best Grade Acid Phosphate	Henderson	17.00							13.60
4716	Venable Fertilizer Co., Richmond, Va.	Venable Best Acid Phosphate	Youngsville	16.42							13.14
3552	Va.-Car. Chemical Co., Richmond, Va.	Atlantic and Virginia Fertilizer Co.'s Eureka Acid Phosphate.	Asheville	15.52							12.42
4029	do	Davie & Whittle's Owl Brand High Grade Acid Phosphate.	Mooreville	16.14							12.91
3568	do	Durham Fertilizer Co.'s Best Acid Phosphate.	Monroe	16.33							13.06
5939	do	Southern Chemical Co.'s Comet, 16 Per Cent Acid Phosphate.	Lillington	15.87							12.70
3648	do	do	Statesville	16.17							12.94
6090	do	do	Mount Airy	16.10							12.88
3889	do	S. W. Travers & Co.'s Champion Acid Phosphate.	Elkin	15.35							12.28
3593	do	Va.-Car. Chemical Co.'s 16 Per Cent Acid Phosphate.	Burlington	15.20							12.16
3569	do	do	Wadesboro	17.24							13.79
5899	do	do	Henderson	16.52							13.22
5911	do	do	Belhaven	16.54							13.23
				15.80							12.64

3647	.....do.....	Va. State Fertilizer Co.'s Bull Run Acid Phosphate.	Statesville.....	16.11				12.89
4162	Wilson Chemical Co., Wilson, N. C.	High Grade 16 Per Cent Acid Phosphate.	Four Oaks.....	17.83				14.26
6063	Winborne Guano Co., Norfolk, Va.	High Grade Acid Phosphate.....	Edenton.....	16.47				13.18
6023	.....do.....	.....do.....	Scotland Neck.....	16.20				12.96
4170	.....do.....	Winborne's High Grade Acid Phosphate.	Elizabeth City.....	15.89				12.71
4575	Young, J. R., Fertilizer Co., Norfolk, Va.	High Grade 16 Per Cent Acid Phosphate.	Lillington.....	16.32				13.06
	<b>Brands claiming</b>			24.00				19.20
4756	Va.-Car. Chemical Co., Richmond, Va.	Va.-Car. Chem. Co.'s Concentrated Acid Phosphate.	North Wilkesboro.....	22.80				18.24
4726	.....do.....	.....do.....	Brevard.....	20.77				16.62
	<b>Brands claiming</b>						2.25	1.80
5903	Lee, A. S., & Sons Co., Richmond, Va.	Lee's Prepared Agricultural Lime	Grimesland.....				2.44	1.95
5903	.....do.....	.....do.....	Sharpsburg.....				1.42	1.14
	<b>Brands claiming</b>						12.00	9.60
3755	Acme Mig. Co., Wilmington, N. C.	Genuine German Kainit.....	Raeiford.....				13.58	10.86
4598	American Agricultural Chemical Co., New York, N. Y.	.....do.....	Moorestville.....				11.46	9.17
5904	American Fertilizer Co., Wilmington, N. C.	.....do.....	Sharpsburg.....				13.72	11.98
4254	Armour Fertilizer Works, Wilmington, N. C.	.....do.....	Maysville.....				12.36	9.89
4365	Arps, George L., & Co., Norfolk, Va.	.....do.....	Eure.....				12.78	10.22
4135	Baugh & Sons Co., Norfolk, Va.	.....do.....	Edenton.....				12.48	9.99
3906	Carolina Union Fertilizer Co., Norfolk, Va.	.....do.....	Elizabeth City.....				11.32	9.06
5955	Chesapeake Chemical Co., Baltimore, Md.	C. C. Co.'s Pure German Kainit	Windsor.....				12.96	10.37
4583	Coe-Mortimer Co., Charleston, S. C.	Genuine German Kainit.....	Laurinburg.....				12.48	9.98
4246	Columbia Guano Co., Norfolk, Va.	.....do.....	Edenton.....				13.48	10.78
3835	Combalee Fertilizer Co., Charleston, S. C.	.....do.....	Morven.....				12.86	10.29
3525	Conestee Chemical Co., Wilmington, N. C.	.....do.....	Wadesboro.....				13.62	10.90
4596	Coöperative Warehouse Co., Salisbury, N. C.	.....do.....	China Grove.....				12.92	10.34

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.							Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Potash from Muriate.	Potash from Sulphate.		Chlorine.
RAW OR UNMIXED FERTILIZER MATERIALS.												
Brands claiming												
4247	Coöperative Warehouse Co., Salisbury, N. C.	Genuine German Kainit.	Elizabeth City						12.00			\$ 9.60
4340	Craven Chemical Co., New Bern, N. C.	do.	Trenton						11.50			9.20
5975	Dixie Guano Co., Suffolk, Va.	Dixie Kainit.	Greenville						12.04			9.63
4136	do.	Kainit.	Edenton						11.96			9.57
3746	Eastern Cotton Oil Co., Hertford, N. C.	Genuine German Kainit.	Elizabeth City						11.66			9.33
3811	Farmers Cotton Oil Co., Wilson, N. C.	do.	Wilson						11.52			9.22
4520	Farmers Guano Co., Raleigh, N. C.	do.	Troy						12.40			9.92
6018	Farmers Guano Co., Norfolk, Va.	do.	Scotland Neck						13.36			10.69
4133	do.	do.	Scotland Neck						12.24			9.79
4483	Farmville Oil and Fertilizer Co., Farmville, N. C.	do.	Ayden						11.68			9.34
3689	Foreign Products Co., Norfolk, Va.	do.	Enfield						13.02			10.42
4173	Grandy, N. G., & Co., Elizabeth City, N. C.	Genuine Kainit.	Elizabeth City						13.20			10.56
3872	Gulfport Fertilizer Co., Atlanta, Ga.	Genuine German Kainit.	Rockingham						12.70			10.17
4449	Hampton Guano Co., Norfolk, Va.	do.	Indian Trail						13.68			10.94
4265	Imperial Co., Norfolk, Va.	Imperial Genuine German Kainit.	Edenton						13.56			10.85
4539	Lenoir Oil and Ice Co., Richmond, Va.	Genuine German Kainit.	Richlands						13.20			10.56
									14.08			11.26

6026	Marlboro Fertilizer Co., Bennettsville, S. C.	do	Candor	13.92	11.14
4339	Marietta Fertilizer Co., Atlanta, Ga.	do	Trenton	11.92	9.54
6105	do	German Kainit	Franklinton	11.40	9.12
4230	Martin Fertilizer Co., Norfolk, Va.	Martin's Genuine German Kainit	Edenton	12.08	9.66
6011	do	Martin's German Kainit	Henderson	11.50	9.20
5986	McNair, J. F., Laurinburg, N. C.	Genuine German Kainit	Fayetteville	14.14	11.31
3676	Navassa Guano Co., Wilmington, N. C.	do	Clinton	12.12	10.02
4128	do	do	Shelby	11.82	9.46
3677	N. C. Cotton Oil Co., Wilmington, N. C.	do	Lillington	13.26	10.61
4056	do	do	Scotland Neck	13.26	10.60
3765	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	do	New Bern	13.76	11.00
3929	Nitrate Agencies Co., Norfolk, Va.	Kainit	Concord	14.08	11.26
3821	do	do	Edenton	12.32	9.86
4079	Pamlico Chemical Co., Washington, N. C.	Genuine German Kainit	Bayboro	14.16	11.33
4385	Patapsco Guano Co., Baltimore, Md.	do	Fremont	12.54	10.03
3880	Pearsall & Co., Wilmington, N. C.	Pearsall's Genuine German Kainit	Red Springs	13.38	10.70
3641	do	do	Wallace	13.34	10.67
4105	Phillips, F. T., Washington, N. C.	Genuine German Kainit	Washington	13.32	10.66
3571	Piedmont-Mount Airy Guano Co., Baltimore, Md.	do	Monroe	10.30	8.24
3836	Planters Fertilizer and Phosphate Co., Charleston, S. C.	do	Morven	13.32	10.66
4249	Pocomoke Guano Co., Norfolk, Va.	do	Elizabeth City	13.26	10.61
4456	Robersonville Guano Co., Robersonville, N. C.	Roberson's Genuine German Kainit	Robersonville	13.14	10.51
4248	Robertson Fertilizer Co., Norfolk, Va.	Genuine German Kainit	Elizabeth City	13.20	10.56
4430	Richmond Guano Co., Richmond, Va.	Pure German Kainit	Concord	13.38	10.70
3879	Royster, F. S., Guano Co., Norfolk, Va.	Genuine German Kainit	Rockingham	13.56	10.85
4521	Swift Fertilizer Works, Wilmington, N. C.	Swift's Pure German Kainit	Troy	11.86	9.49

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.								Relative Value Per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.	Potash from Sulphate.		Chlorine.
RAW OR UNMIXED FERTILIZER MATERIALS.													
Brands claiming													
3990	Tuscarora Fertilizer Co., Greensboro, N. C.	German Kainit.	Franklinton.							12.00			\$ 9.60
3524	Union Guano Co., Winston, N. C.	Genuine German Kainit.	Wadesboro							12.10			9.68
4438	Upshur, R. L., Guano Co., Norfolk, Va.	do.	Edenton							12.50			10.00
4186	United States Fertilizer Co., Baltimore, Md.	Farm Bell German Kainit.	Washington.							12.58			10.06
4576	Vance Guano Co., Henderson, N. C.	German Kainit.	Warrenton							13.12			10.50
3526	Va.-Car. Chemical Co., Richmond, Va.	Genuine German Kainit.	Monroe							11.54			9.23
3905	Winborne Guano Co., Norfolk, Va.	do.	Elizabeth City							14.16			11.33
6064	do.	Winborne Genuine German Kainit.	Edenton							12.60			10.08
4650	Young, J. R., Fertilizer Co., Norfolk, Va.	Genuine German Kainit.	Edenton							12.58			10.06
Brands claiming													
4437	German Kali Works, New York, N. Y.	Sulphate of Potash.	Williamston.							12.90			10.32
4142	Nitrate Agencies Co., Norfolk, Va.	do.	Whitakers.							47.00			37.60
Brands claiming													
3499	Acme Mfg. Co., Wilmington, N. C.	Muriate of Potash.	Mount Olive							50.00			40.00
4280	do.	Sulphate of Potash.	Goldsboro.							48.68			38.94
4241	American Fertilizer Co., Norfolk, Va.	Muriate of Potash.	Wilmington.							48.00			38.40
										50.04			40.03
										49.64			39.71
										51.16			40.93

4789	Atlantic Chemical Co., Charlotte, N. C.	do.	Derita.	48.68	38.96
4871	Columbia Guano Co., Norfolk, Va.	do.	Fremont	48.64	38.91
5961	Coöperative Warehouse Co., Salisbury, N. C.	do.	China Grove.	50.42	40.84
3948	Foreign Products Co., Baltimore, Md.	do.	Edenton	52.24	41.79
3688	German Kali Works, New York, N. Y.	do.	Enfield	50.74	40.59
5892	do.	do.	Fayetteville	49.76	39.81
3930	International Agricultural Corporation, Atlanta, Ga.	do.	Concord	51.76	41.41
4117	Nitrate Agencies Co., Norfolk, Va.	do.	Greensboro.	50.00	40.00
6051	do.	do.	Yander	49.64	39.71
4436	McNair, J. F., Laurinburg, N. C.	do.	Williamston	51.96	41.57
3698	do.	do.	Red Springs	49.92	39.94
4080	Famlico Chemical Co., Washington, N. C.	do.	Bayboro	50.76	40.61
3640	Pearsall & Co., Wilmington, N. C.	do.	Wallace	49.80	39.84
4106	Phillips, F. T., Washington, N. C.	do.	Washington	53.76	43.01
4107	do.	do.	Washington	49.12	39.30
4338	Royster, F. S., Guano Co., Norfolk, Va.	Sulphate of Potash.	Kinston	50.20	40.16
4337	do.	Muriate of Potash.	Kinston	48.04	38.43
4872	Southern Cotton Oil Co., Goldsboro, N. C.	Guaranteed 48 Per Cent Potash.	Goldsboro	48.76	39.01
4241	Va.-Car. Chemical Co., Richmond, Va.	Sulphate of Potash.	Whiteville	49.04	39.23
<b>Brands claiming</b>				<b>49.00</b>	<b>39.20</b>
4788	American Agricultural Chemical Co., New York, N. Y.	Muriate of Potash.	Bessemer City	50.08	40.06
4132	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Muriate of Potash.	Scotland Neck	51.20	40.97
<b>Brands claiming</b>				<b>50.00</b>	<b>40.00</b>
4640	Armour Fertilizer Works, Wilmington, N. C.	Muriate of Potash.	Rocky Point	48.08	38.46
4620	Baugh & Sons Co., Norfolk, Va.	do.	Elizabeth City	53.88	43.10
6052	Foreign Products Co., Wilmington, N. C.	do.	Stedman	53.24	42.59

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.							Relative Value per Ton at Factory.		
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Total Potash.	Potash from Muriate.		Potash from Sulphate.	Chlorine.
RAW OR UNMIXED FERTILIZER MATERIALS.													
Brands claiming													
4632	Foreign Products Co., Charleston, S. C.	Muriate of Potash	Mount Olive							50.00		\$40.00	
3572	Foreign Products Co., Norfolk, Va.	do.	Wadesboro							49.48		39.58	
6008	Nitrate Agencies Co., Norfolk, Va.	do.	Palmyra							49.40		39.52	
4531	do.	do.	Jackson							51.44		41.15	
4534	Pamlico Chemical Co., Washington, N. C.	Sulphate of Potash	Washington							47.08		37.66	
4431	Richmond Guano Co., Richmond, Va.	Muriate of Potash	Concord							49.44		39.55	
3922	Swift Fertilizer Works, Wilmington, N. C.	Swift's Muriate of Potash	Clarkton							50.28		40.22	
3897	Tuscarora Fertilizer Co., Greensboro, N. C.	Muriate of Potash	Ashboro							50.20		40.16	
4745	Upshur, R. L., Guano Co., Norfolk, Va.	do.	Sunbury							49.60		39.69	
Brand claiming													
									5.69	6.92		22.19	
4631	Pearsall & Co., Wilmington, N. C.	Fish Scrap	Mount Olive						5.43	6.60		21.18	
Brands claiming													
4134	Foreign Products Co., Baltimore, Md.	Ground Fish	Edenton						7.40	9.00		28.86	
6019	do.	do.	Scotland Neck	1.30	6.30				7.60	9.24		29.64	
5897	do.	do.	Edenton						6.78	8.24		26.44	
4104	Phillips, F. T., Washington, N. C.	Fish Scrap	Edenton						6.67	8.11		26.01	
		do.	Washington	.44	6.88				7.32	8.90		28.55	

Brands claiming				8.23	10.00	32.10
4429	Coöperative Warehouse Co., Salisbury, N. C.	High Grade Tankage	China Grove	9.33	11.34	36.39
3484	Farmers Guano Co., Norfolk, Va.	Ground Fish	Goldsboro	8.07	9.81	31.47
4744	do.	do.	Sunbury	7.99	9.71	31.16
5915	Foreign Products Co., Baltimore, Md.	Fish Scrap	Edenton	7.70	9.36	30.03
4362	do.	Ground Fish	Woodland	7.53	9.15	29.37
4253	Harvey, L., & Son Co., Kinston, N. C.	Fish Scrap	Kinston	8.27	10.05	32.25
5939	Josey, N. B., Guano Co., Tarboro, N. C.	do.	Hookerton	6.75	8.21	26.32
4055	do.	do.	Scotland Neck	6.63	8.06	25.86
5931	do.	do.	Hookerton	5.39	6.55	21.02
5970	Meadows, E. H. & J. A. Co., New Bern, N. C.	Ground Fish Scrap	Hookerton	7.90	9.60	30.81
6020	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	High Grade Fish Scrap	Palmyra	8.36	10.16	32.60
3498	do.	do.	Mount Olive	7.63	9.28	29.76
4082	Pamlico Chemical Co., Washington, N. C.	Ground Fish	Bayboro	8.28		32.29
3628	Pidmont-Mount Airy Guano Co., Baltimore, Md.	do.	Williamston	6.79	8.26	26.48
Brand claiming				8.35	10.15	32.57
4778	Union Guano Co., Winston-Salem, N. C.	High Grade Tankage	Albemarle	8.05	9.79	31.39
Brand claiming				8.84	10.75	34.48
4303	Nitrate Agencies Co., Norfolk, Va.	Dried Fish Scrap	Seaboard	8.73	10.61	34.05
Brand claiming				11.51	14.00	44.89
3497	Acme Mfg. Co., Wilmington, N. C.	Dried Blood	Mount Olive	11.15	13.56	43.48
Brands claiming				13.20	16.00	51.48
3485	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Dried Blood	Mount Olive	12.15	14.77	47.39
6038	Nitrate Agencies Co., Norfolk, Va.	Dry Ground Blood	Fair Bluff	13.20	16.00	51.48
6007	do.	do.	Williamston	12.92	15.71	50.38
4103	Phillips, F. T., Washington, N. C.	Dried Blood	Washington	13.66	16.61	53.27

## ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1914.

Laboratory Number.	Name and Address of Manufacturer.	Name of Brand.	Where Sampled.	Percentage Composition or Parts per 100.							Relative Value per Ton at Factory.	
				Available Phosphoric Acid.	Water-soluble Nitrogen.	Organic Nitrogen.	Total Nitrogen.	Equivalent to Ammonia.	Potash from Muriate.	Potash from Sulphate.		Chlorine.
RAW OR UNMIXED FERTILIZER MATERIALS.												
	Brand claiming											
3928	Foreign Products Co., Baltimore, Md.	High Grade Blood	Concord				13.98	17.00				\$54.52
	Brands claiming						13.00	15.81				50.70
3927	Grace, W. R., & Co., New York, N. Y.	Nitrate of Soda	Concord				14.36	16.24				56.00
4435	do.	do.	Williamston				15.52	18.87				60.53
	Brands claiming						15.18	18.46				59.02
4031	Grace, W. R., & Co., New York, N. Y.	Nitrate of Soda	Statesville				14.55	17.69				56.75
4086	Pearsall & Co., Wilmington, N. C.	do.	Salisbury				15.30	18.60				59.67
5055	Va.-Car. Chemical Co., Richmond, Va.	do.	Fayetteville				15.28	18.58				59.59
	Brands claiming						15.60	18.97				60.84
5981	Acme Mfg. Co., Wilmington, N. C.	Nitrate of Soda	Dunn				14.81	18.00				57.76
4185	Carolina Union Fertilizer Co., Norfolk, Va.	do.	Edenton				15.00	18.24				58.50
4826	Cooper Guano Co., Wilmington, N. C.	do.	Garland				15.30	18.60				59.67
3946	Foreign Products Co., Baltimore, Md.	do.	Edenton				15.54	18.89				60.61
6053	Grace, W. R., & Co., New York, N. Y.	do.	Stedman				15.44	18.78				60.22
5987	do.	do.	Fayetteville				15.84	19.26				61.78
6077	do.	do.	Fayetteville				15.48	18.82				60.37
							15.42	18.75				60.14





6029	do.	do.	Edenton.	20.88	3.00	3.65	3.04	32.34
5924	do.	do.	Edenton.	20.75	2.98	3.62	3.12	32.24
	<b>Brand claiming</b>			17.00				13.60
3820	Nitrate Agencies Co., Norfolk, Va.	Basic Slag		16.48				13.18
	<b>Brands claiming</b>			18.00				14.40
4705	Coe-Mortimer Co., Charleston, S. C.	Thomas Phosphate	Spruce Pine.	18.17				14.54
5901	Coöperative Warehouse Co., Salisbury, N. C.	do.	Salisbury	17.93				14.34
6005	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	do.	Palmyra	17.15				13.72

\*Total Phosphoric Acid in Bone Meal, Peruvian Guano, and Thomas Phosphate at 4 cents per pound.

## II. ANALYSES OF COTTON-SEED MEAL.

Laboratory Number.	Name and Address of Manufacturer.	Where Sampled.	Per Cent Nitrogen Guaranteed.	Equivalent to Ammonia.	Per Cent Nitrogen Found.	Equivalent to Ammonia.
5195	American Fertilizing Co., Norfolk, Va.....	Weldon.....	6.17	7.50	6.18	7.51
5297	Atlantic Chemical Co., Norfolk, Va.....	Edenton.....	6.17	7.50	5.70	6.93
5256	Battleboro Oil Co., Battleboro, N. C.....	Kinston.....	6.17	7.50	5.88	7.15
5235	Bertie Cotton Oil Co., Aulander, N. C.....	Windsor.....	6.17	7.50	6.14	7.47
5313	Bragaw Fertilizer Co., Washington, N. C.....	Washington.....	6.17	7.50	6.17	7.50
5230	.....do.....	.....do.....	6.17	7.50	6.17	7.50
5237	Broadway Cotton Oil Co., Belton, N. C.....	Brevard.....	6.17	7.50	6.20	7.54
5213	Buckeye Cotton Oil Co., Cincinnati, Ohio.....	Waynesville.....	6.17	7.50	6.24	7.59
5261	.....do.....	China Grove.....	6.17	7.50	6.24	7.59
5155	.....do.....	Crouse.....	6.17	7.50	6.06	7.37
5191	.....do.....	Greensboro.....	6.17	7.50	6.04	7.34
5246	.....do.....	Wadesboro.....	6.17	7.50	6.04	7.34
5215	.....do.....	Sylva.....	6.17	7.50	5.86	7.12
517	.....do.....	Vander.....	6.17	7.50	5.82	7.08
5211	.....do.....	Hazelwood.....	6.17	7.50	5.76	7.00
5212	.....do.....	Waynesville.....	6.17	7.50	5.74	6.98
5152	.....do.....	Marion.....	6.17	7.50	5.30	6.44
5174	Chatham Oil and Fertilizer Co., Pittsboro, N. C.....	Pittsboro.....	6.17	7.50	5.98	7.27
5236	Cherokee Commission Co., Gaffney, S. C.....	Brevard.....	6.17	7.50	6.52	7.93
5223	.....do.....	Asheville.....	6.17	7.50	6.26	7.61
5189	Clayton Oil Mills Co., Clayton, N. C.....	Clayton.....	6.17	7.50	6.44	7.83
5278	.....do.....	Pine Level.....	6.17	7.50	6.38	7.76
5184	Consumers Cotton Oil Co., Tarboro, N. C.....	Tarboro.....	6.17	7.50	6.36	7.73
5306	.....do.....	Edenton.....	6.17	7.50	6.17	7.50
5231	.....do.....	Williamston.....	6.17	7.50	6.14	7.47
5275	.....do.....	Speed.....	6.17	7.50	5.62	6.83
5294	.....do.....	Edenton.....	6.17	7.50	5.27	6.41
509	Cotton Oil and Gin Co., Scotland Neck, N. C.....	Scotland Neck.....	6.17	7.50	6.26	7.61
511	.....do.....	Palmyra.....	6.17	7.50	6.18	7.51
5187	Dunn Oil Mill Co., Dunn, N. C.....	Dunn.....	6.17	7.50	6.88	8.36
5266	Eastern Cotton Oil Co., Hertford, N. C.....	Edenton.....	6.17	7.50	6.20	7.54
5276	.....do.....	.....do.....	6.17	7.50	6.14	7.47
5308	.....do.....	Elizabeth City.....	6.17	7.50	6.12	7.44
5265	.....do.....	Edenton.....	6.17	7.50	6.12	7.44
5228	.....do.....	.....do.....	6.17	7.50	5.96	7.25
5295	.....do.....	.....do.....	6.17	7.50	5.88	7.15

## ANALYSES OF COTTON-SEED MEAL.

Laboratory Number.	Name and Address of Manufacturer.	Where Sampled.	Per Cent Nitrogen Guaranteed.	Equivalent to Ammonia.	Per Cent Nitrogen Found.	Equivalent to Ammonia.
5298	Eastern Cotton Oil Co., Hertford, N. C. ....	Edenton .....	6.17	7.50	<b>5.84</b>	7.10
5307	do .....	do .....	6.17	7.50	<b>5.76</b>	7.00
5169	do .....	Elizabeth City ..	6.17	7.50	<b>5.30</b>	6.44
5192	Elba Mfg. Co., Charlotte, N. C. ....	Winston .....	6.17	7.50	6.62.	8.05
5271	do .....	Matthews .....	6.17	7.50	6.58	8.00
5165	do .....	Maxton .....	6.17	7.50	6.52	7.93
5242	do .....	Wadesboro .....	6.17	7.50	6.52	7.93
5267	do .....	Creedmoor .....	6.17	7.50	6.48	7.88
5232	do .....	Gastonia .....	6.17	7.50	6.30	7.66
5291	do .....	Greensboro .....	6.17	7.50	6.20	7.54
5162	do .....	Laurinburg .....	6.17	7.50	6.18.	7.51
5217	do .....	Clyde .....	6.17	7.50	6.17	7.50
5177	do .....	Black Mountain..	6.17	7.50	<b>5.94</b>	7.22
5171	do .....	Charlotte .....	6.17	7.50	<b>5.76</b>	7.00
5263	Elizabeth City Cotton Oil Co., Elizabeth City, N. C. .	Elizabeth City ..	6.17	7.50	6.60	8.02
5258	do .....	do .....	6.17	7.50	6.27	7.62
5183	Farmers Oil Mill Co., Nashville, N. C. ....	Nashville .....	6.17	7.50	6.48	7.88
5244	Farmers Cotton Oil Co., Wilson, N. C. ....	Roper .....	6.17	7.50	6.24	7.59
5229	do .....	Wilson .....	6.17	7.50	6.18	7.51
5208	do .....	Edenton .....	6.17	7.50	<b>6.14</b>	7.47
5243	do .....	do .....	6.17	7.50	<b>6.10</b>	7.42
5240	do .....	Mount Olive .....	6.17	7.50	<b>6.06</b>	7.37
5166	do .....	Greenville .....	6.17	7.50	<b>6.02</b>	7.32
5209	do .....	Edenton .....	6.17	7.50	<b>5.96</b>	7.25
5300	do .....	Oak City .....	6.17	7.50	<b>5.92</b>	7.20
516	do .....	Edenton .....	6.17	7.50	<b>5.76</b>	7.00
5186	Farmville Oil and Fertilizer Co., Farmville, N. C. ....	Greenville .....	6.17	7.50	6.32	7.68
5146	Fort Valley Oil Co., Fort Valley, Ga. ....	Bryson City .....	6.17	7.50	6.18	7.51
5170	Fremont Oil Mill Co., Fremont, N. C. ....	Fremont .....	6.17	7.50	6.48	7.88
5304	do .....	do .....	6.17	7.50	6.20	7.54
5220	Georgia Cotton Oil Co., Atlanta, Ga. ....	Whitten .....	6.17	7.50	<b>6.00</b>	7.29
5268	Greer Cotton-seed Oil Co., Greer, S. C. ....	Penrose .....	6.17	7.50	<b>6.04</b>	7.34
5262	Havens Oil Co., Washington, N. C. ....	Mackeys .....	6.17	7.50	6.17	7.50
5151	Kershaw Oil Mill, Kershaw, S. C. ....	Gastonia .....	6.17	7.50	6.60	8.02
5149	do .....	Asheville .....	6.17	7.50	6.34	7.71
5221	do .....	do .....	6.17	7.50	<b>5.96</b>	7.25

## ANALYSES OF COTTON-SEED MEAL.

Laboratory Number.	Name and Address of Manufacturer.	Where Sampled.	Per Cent Nitrogen Guaranteed.	Equivalent to Ammonia.	Per Cent Nitrogen Found.	Equivalent to Ammonia.
5235	Kings Mountain Cotton Oil Co., Kings Mountain, N. C.	Kings Mountain	6.17	7.50	6.74	8.19
5153	Lancaster Cotton Oil Co., Lancaster, S. C.	Marion	6.17	7.50	6.14	7.47
5293	Laurinburg Oil Co., Laurinburg, N. C.	Laurinburg	6.17	7.50	5.27	6.41
5273	Lee County Cotton Oil Co., Sanford, N. C.	Lemon Springs	6.17	7.50	6.00	7.29
5279	Lenoir Oil and Ice Co., Kinston, N. C.	Pink Hill	6.17	7.50	6.30	7.66
5255	do	Kinston	6.17	7.50	6.02	7.32
5179	Lorene Cotton Oil Co., Mooresville, N. C.	Mooresville	6.17	7.50	6.76	8.22
521	do	do	6.17	7.50	6.64	8.07
5250	do	do	6.17	7.50	6.62	8.05
5193	Louisburg Cotton Oil Mills, Louisburg, N. C.	Oxford	6.17	7.50	6.18	7.51
5254	do	Durham	6.17	7.50	6.10	7.42
5203	do	Littleton	6.17	7.50	5.82	7.08
5280	Marion Cotton Oil Co., Marion, S. C.	Whiteville	6.17	7.50	6.46	7.85
5224	McCaw Mfg. Co., Macon, Ga.	Asheville	6.17	7.50	6.04	7.34
5147	do	Murphy	6.17	7.50	5.94	7.22
5180	Mooresville Oil Mills, Mooresville, N. C.	Mooresville	6.17	7.50	6.60	8.02
526	do	do	6.17	7.50	6.38	7.76
5206	Morgan Oil and Fertilizer Co., Red Springs, N. C.	Parkton	6.17	7.50	6.04	7.34
5302	Mount Gilead Cotton Oil Co., Mount Gilead, N. C.	West End	6.17	7.50	6.06	7.37
5281	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Edenton	6.17	7.50	6.26	7.61
5239	do	Mount Olive	6.17	7.50	6.20	7.54
5257	do	Robersonville	6.17	7.50	6.06	7.37
5168	do	New Bern	6.17	7.50	6.04	7.34
5173	Newton Oil and Fertilizer Co., Newton, N. C.	Connelly Springs	6.17	7.50	6.34	7.71
5251	do	Newton	6.17	7.50	5.96	7.25
5148	North Carolina Cotton Oil Co., Charlotte, N. C.	Asheville	6.17	7.50	6.34	7.71
5227	do	Laundale	6.17	7.50	6.18	7.51
5159	do	Charlotte	6.17	7.50	6.12	7.32
5260	do	Lexington	6.17	7.50	5.90	7.17
5178	do	Concord	6.17	7.50	5.38	6.54
5259	do Henderson, N. C.	Oxford	6.17	7.50	6.46	7.85
5194	do	do	6.17	7.50	6.26	7.61
5204	do	Franklinton	6.17	7.50	6.22	7.56
5196	do Raleigh, N. C.	do	6.17	7.50	6.28	7.64
5175	do	Raleigh	6.17	7.50	6.12	7.44
5210	do	Trotville	6.17	7.50	5.74	6.98

## ANALYSES OF COTTON-SEED MEAL.

Laboratory Number.	Name and Address of Manufacturer.	Where Sampled.	Per Cent Nitrogen Guaranteed.	Equivalent to Ammonia.	Per Cent Nitrogen Found.	Equivalent to Ammonia.
5253	North Carolina Cotton Oil Co., Wilmington, N. C.	Dunn	6.17	7.50	6.16	7.49
5163	do	Chadbourn	6.17	7.50	6.02	7.32
5241	do	Warsaw	6.17	7.50	5.98	7.27
528	do	Scotland Neck	6.17	7.50	5.96	7.25
5155	Pine Level Oil Mill, Pine Level, N. C.	Pine Level	6.17	7.50	6.10	7.42
5181	Planters Oil Mill, Blacksburg, S. C.	Grover	6.17	7.50	6.56	7.98
5238	Rich Hill Oil Mill Co., Whitestone, S. C.	Hendersonville	6.17	7.50	5.94	7.22
5161	Robertson Mfg. Co., Lumberton, N. C.	Lumberton	6.17	7.50	6.02	7.32
5287	Royster, F. S., Guano Co., Norfolk, Va.	Edenton	6.17	7.50	7.44	9.05
5289	do	do	6.17	7.50	6.04	7.34
5164	Rowland Oil and Fertilizer Co., Rowland, N. C.	Rowland	6.17	7.50	6.38	7.76
5205	do	Red Springs	6.17	7.50	6.02	7.32
5176	Southern Cotton Oil Co., Charlotte, N. C.	Forest City	6.17	7.50	6.20	7.54
5234	do	Charlotte	6.17	7.50	5.98	7.27
507	do	Candor	6.17	7.50	5.92	7.20
5226	do	Raeftord	6.17	7.50	5.63	6.84
5303	do Chester, S. C.	West End	6.17	7.50	6.32	7.68
5145	do Concord, N. C.	Concord	6.17	7.50	6.30	7.66
5157	do	Mount Olive	6.17	7.50	6.08	7.39
5299	do Conetoe, N. C.	Hobgood	6.17	7.50	6.68	8.12
5160	do Davidson, N. C.	Catawba	6.17	7.50	6.12	7.44
5272	do	Salisbury	6.17	7.50	5.96	7.25
5249	do	Catawba	6.17	7.50	5.68	6.91
5305	do Fayetteville, N. C.	Fayetteville	6.17	7.50	6.24	7.59
5188	do	Linden	6.17	7.50	6.02	7.32
5284	do Gastonia, N. C.	Long Shoals	6.17	7.50	6.16	7.49
5167	do Goldsboro, N. C.	LaGrange	6.17	7.50	6.24	7.59
5150	do Macon, Ga.	Murphy	6.17	7.50	6.42	7.81
5219	do	Judson	6.17	7.50	5.76	7.00
5182	do Rocky Mount, N. C.	Rocky Mount	6.17	7.50	6.26	7.61
5207	do	Enfield	6.17	7.50	6.00	7.29
5156	do Selma, N. C.	Selma	6.17	7.50	5.72	6.95
5248	do Shelby, N. C.	Shelby	6.17	7.50	6.38	7.76
5270	do	Spruce Pine	6.17	7.50	5.90	7.17
5247	do Spartanburg, S. C.	Brevard	6.17	7.50	6.04	7.34
5286	do Tarboro, N. C.	Ahoskie	6.17	7.50	6.36	7.73

## ANALYSES OF COTTON-SEED MEAL.

Laboratory Number.	Name and Address of Manufacturer.	Where Sampled.	Per Cent Nitrogen Guaranteed.	Equivalent to Ammonia.	Per Cent Nitrogen Found.	Equivalent to Ammonia.
5185	Southern Cotton Oil Co., Tarboro, N. C.....	Tarboro.....	6.17	7.50	6.36	7.73
506	.....do.....	.....do.....	6.17	7.50	6.06	7.37
5154	.....do..... Wadesboro, N. C.....	Lilesville.....	6.17	7.50	6.04	7.34
5277	.....do..... Washington, N. C.....	Kellum.....	6.17	7.50	6.36	7.73
5190	.....do..... Wilson, N. C.....	Wilson.....	6.17	7.50	5.50	7.90
5264	.....do.....	Enfield.....	6.17	7.50	5.90	7.17
5310	Spring Hope Cotton Oil Co., Spring Hope, N. C.....	Middlesex.....	6.17	7.50	6.10	7.32
537	Stanly Cotton Oil Co., Norwood, N. C.....	Norwood.....	6.17	7.50	6.58	8.00
5312	Tar River Oil Co., Tarboro, N. C.....	Washington.....	6.17	7.50	6.48	7.88
5311	Union Guano Co., Winston, N. C.....	Princeton.....	6.17	7.50	6.20	7.54
5296	Union Seed and Fertilizer Co., Raleigh, N. C.....	New Hill.....	6.17	7.50	5.80	7.05
510	.....do..... Wilmington, N. C.....	Scotland Neck .....	6.17	7.50	5.80	7.05
5293	.....do.....	Fountain.....	6.17	7.50	5.76	7.00
5283	Victor Cotton Oil Co., Yorkville, S. C.....	High Shoals.....	6.17	7.50	6.38	7.76
5172	.....do.....	Earl.....	6.17	7.50	6.32	7.68
5274	Virginia-Carolina Chemical Co., Richmond, Va.....	Edenton.....	6.17	7.50	6.28	7.64
5301	.....do.....	.....do.....	6.17	7.50	6.08	7.39
5288	.....do.....	Trenton.....	6.17	7.50	6.00	7.29
5269	Wilmot Oil Mills, Pelzer, S. C.....	Horse Shoe.....	6.17	7.50	6.06	7.37
5245	Winder Oil Mill Co., Winder, Ga.....	Wadesboro.....	6.17	7.50	6.36	7.73
5309	Zebulon Cotton Oil Co., Zebulon, N. C.....	Middlesex.....	6.17	7.50	6.50	7.90

## LEAF TOBACCO SALES FOR YEAR, AUGUST, 1913-AUGUST, 1914.

Pounds sold for producers, first hand.....	172,386,131
Pounds sold for dealers.....	9,866,642
Pounds sold for warehouses .....	7,390,542
Total.....	189,643,315

## LEAF TOBACCO SALES FOR SEPTEMBER, 1914.

Pounds sold for producers, first hand.....	29,303,232
Pounds sold for dealers.....	1,556,874
Pounds sold for warehouses .....	1,024,826
Total.....	31,884,932

**THE BULLETIN**  
OF THE  
**NORTH CAROLINA**  
**DEPARTMENT OF AGRICULTURE**  
**RALEIGH**

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**Vol. 35, No. 11.      SUPPLEMENT TO NOVEMBER, 1914      Whole No. 203**

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**Progressive Development of North Carolina Agriculture**  
WITH A BRIEF DISCUSSION OF  
**FOOD AND FEED PRODUCTS SHIPPED INTO THE STATE DURING YEAR 1913**  
(Bulletin No. 8, Vol. 33, Revised)

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## LETTER OF TRANSMITTAL

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HON. W. A. GRAHAM,  
*Commissioner of Agriculture,*  
*Raleigh, N. C.*

SIR:—I beg to submit herewith a manuscript, a revision of Bulletin No. 8, discussing, in a brief way, some of the different lines of progress of agriculture in North Carolina during the recent past. To those who desire a full discussion of the agricultural development of the State this Bulletin will be painfully brief; but we have only to point out that it would require a good-sized volume to do the subject justice, and that the time at our command and the space allotted to us would not permit a fuller discussion of the subject. We have been able, therefore, in this paper to call attention to only a few things among the many that cause North Carolina to stand out prominently above many other states.

In the last part of the paper is found a brief discussion of the amount of food and feed products shipped into the State during 1913. Most of the data for this part of the paper were obtained from the books of the different railway companies doing an interstate business in North Carolina.

I recommend the publication of this manuscript as a supplement from the Botany and Agronomy Division to the November Bulletin of this Department.

Respectfully submitted,

J. L. BURGESS,  
*Agronomist and Botanist.*

Approved:

W. A. GRAHAM,  
*Commissioner.*



# **Progressive Development of North Carolina Agriculture**

**WITH A BRIEF DISCUSSION OF  
FOOD AND FEED PRODUCTS SHIPPED INTO NORTH CAROLINA  
DURING 1913**

---

By J. L. BURGESS, Agronomist and Botanist.

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## **STATUS OF THE FARMER.**

Forty years ago North Carolina was a good state to be from; now it is one of the very best states in the Union to be in.

Agriculture in those days was frequently thought of as a hardship imposed upon the unfortunates who had to "toil" the soil for a living, and was, in many cases, looked upon as an occupation suitable for only those who were either financially or mentally incapable of pursuing a more popular calling.

But a change has come. Instead of being a drudgery and a despised menial occupation, as it once was, farming has, within the last two decades, been elevated to a position having the dignity of a profession, or a business, touching the intellect at every angle and taxing the mind to its utmost in grappling with the problems that daily arise on the farm for solution. Men everywhere are viewing the business of farming in a more favorable light. They are beginning to realize that there is no occupation more honorable, more necessary to the welfare of the State, or more deserving of the best efforts and energies in man, than that of tilling the soil. Indeed, all men are now insisting that it is the most noble of occupations, having been divinely instituted when man was first placed upon the earth, and Emerson has pointed out that "The first farmer was the first man, and all historic nobility rests on the possession and use of land."

## **THE FUNDAMENTAL CALLING.**

It is a commonplace that agriculture is the foundation of all other occupations—mining, manufacture, commerce, etc. If we cease to plow, the miner will lay down his pick; factory wheels will stop; locomotives will stand cold and lifeless upon the tracks; abandoned ships will decay in the harbors; fishermen will cease to cast their nets; school children will come home to stay; church bells will cease to ring; and, very soon, savages will again roam over the face of the earth. An ample food supply, therefore, is essential to the highest moral, intellectual, and physical development of the human race. All wars, whether industrial or sanguinary are, in their last analysis, waged over an actual or fancied future scarcity of the necessaries of life. The mightiest factors in the

world's civilization today, then, are the smoke-house and the granary; and, whether we will or not, the modern Atlas is "The Man with the Hoe." Good farming then will ever be the foundation on which all real progress in civilization must be made.

### AGRICULTURAL ADVANTAGES IN NORTH CAROLINA.

#### *Location.*

The fondest hopes of the farmer may be realized right here in North Carolina. New England has little to offer the man who wants to farm. Forty years ago many farmers very wisely left the Old North State for Missouri, Kansas, Nebraska, Iowa, etc., and there homesteaded 160 acres of land that are now worth, in many cases, more than \$32,000. A number of these men have sons who want to farm and can give them \$4,000 to \$6,000 with which to purchase land and equipment. But how much land can be purchased with \$4,000 at \$200 an acre. Few of them would be content with less than 80 acres, and to purchase this, without improvements, would require an outlay of \$16,000. Add \$4,000 for necessary improvements and he will have spent \$20,000 for his 80-acre farm, perhaps, before he has reaped a single harvest or realized a penny on his investment. It is plain, therefore, that a young man of average means in the central west must be a renter if he farms at all. Farther west and northwest, the climate is too cold for any but the hardiest Scandinavians or north European immigrants. In the far west prices are, again, too high and competition too acute for an eastern man of average means. Farther south the climate is too hot and malaria is so prevalent that the health of a man from this latitude would, under average conditions, likely be threatened. Coming back to North Carolina, we find here all the advantages the farmer has anywhere else in the country, and the additional advantage of living in a state destined to become one of the leading manufacturing states of the Union.

Capital has not been slow to accept the invitation tacitly held out by our location with reference to other states, and our strategic position with reference to the future manufacturing development of the country. The 3,500,000 horse-power that but a few years ago was running to waste along the streams of the piedmont and mountain sections of the State is now being harnessed and utilized in the various manufacturing and other industrial enterprises. This immense power is just on the border of the cotton fields and among the forests and the mines. Our climates and soils are capable of producing more than enough to support the largest possible mill population that will ever be needed to manipulate the electric power generated by our streams. We have ample facilities for transporting raw materials and for handling an unlimited amount of finished products. No one is blind to our easy access to deep water on the coast, the Panama Canal, and thence to the Orient. Capital has seen its opportunity among us and has laid the foundation for its own protection and our development.

## MARKETS.

The greatest asset of any agricultural community is a good local market. There was a time when the North Carolina farmer looked in vain for a home market, but that time has passed. There was a time when no one seemed to want anything we had to sell, but economic conditions have so changed that nothing short of a national calamity is likely to reduce the present demand for the products of the North Carolina farm.

In respect to local markets, North Carolina is unexcelled and rarely equaled, by any state in the Union. We have no great metropolis like Baltimore or Washington to handle the bulk of our farm products, but we do have a large number of thriving cities.—Asheville, Gastonia, Charlotte, Winston, Salisbury, Greensboro, Monroe, Durham, Raleigh, Wilmington, Goldsboro, New Bern, Wilson, Rocky Mount, Tarboro, Kinston, Greenville, Washington, Henderson, High Point, Elizabeth City, Fayetteville, and a number of others,—ranging in population from 3,000 to over 30,000 and scattered broadcast over the entire State. It would be practically impossible for a farmer to locate in North Carolina and not be within easy reach of some good home market. The day is fast approaching when it will be unnecessary for the North Carolina farmer to look outside the State for a market for his staple products. This statement can hardly be called visionary when we note the increase in number and kinds of manufactories within our borders and the large towns and consequent good markets which necessarily attend these manufacturing enterprises. New England is coming south with her mills and markets. These industries are constantly calling for more labor, and, since only white labor is wanted, a large percentage of the white farmers that were on farms twenty years ago are now working in the mills. The former producers of farm products have been transformed into consumers of farm products and producers of finished mill products. In other words, the mills have collected men, women, and children from large extents of territory and thus made good local markets for those of the rural population who preferred to stay on the farm.

North Carolina has a population of hundreds of thousands more than Kansas, Nebraska, South Carolina, Tennessee, Alabama, or Mississippi, and more than the states of Colorado, Nevada, Idaho, Montana, Wyoming, Vermont, and Delaware all combined, with a very large percentage of it in the different manufacturing towns. This should give great emphasis to the importance of our local markets for farm products. This fact is brought out clearly in the following table:

TABLE No 1—*Showing Population of North Carolina as Compared with Other States—1910.*

North Carolina .....	2,206,287
Tennessee .....	2,184,789
Alabama .....	2,138,093
Minnesota .....	2,075,708
Virginia .....	2,061,612
Mississippi .....	1,797,114
Kansas .....	1,690,949
Oklahoma .....	1,657,155
Louisiana .....	1,656,388

Arkansas .....	1,574,449
South Carolina .....	1,515,400
Maryland .....	1,295,346
West Virginia .....	1,221,119
Nebraska .....	1,192,214
Washington .....	1,141,990
Connecticut .....	1,114,756
Colorado .....	799,024
Florida .....	752,619
Maine .....	742,371
Oregon .....	672,765
South Dakota .....	583,888
North Dakota .....	577,056
Rhode Island .....	542,610
New Hampshire .....	411,588
Montana .....	376,053
Utah .....	373,351
Vermont .....	355,956
District Columbia .....	331,069
New Mexico .....	327,301
Idaho .....	325,594
Arizona .....	204,354
Delaware .....	202,322
Wyoming .....	145,965

## TRANSPORTATION.

### *Railroads.*

No state in the South has better transportation facilities. Five great railroad systems are rushing through the State to reach deep water on the Atlantic coast, there to connect with steamers for the Panama Canal. Besides these, there are fifty-six other short lines and feeders that ramify the State like so many blood vessels in our great industrial system. Every farmer is thus put in easy reach of a good home market and is but a few hours from Charleston, Atlanta, Memphis, Chattanooga, St. Louis, Chicago, Pittsburg, Richmond, Washington, Baltimore Philadelphia, New York, and Boston.

Not only have we an excellent and rapidly growing system of railroad transportation, covering the entire State like a network, but in eastern North Carolina there is a veritable labyrinth of bays, sounds, canals, and navigable rivers on which there are thousands of boats, barges, and other vessels, handling farm produce between our own larger eastern cities and placing much of it on the markets of the cities to the north and south of us.

### *Country Roads.*

In addition to our superb railroad and water transportation facilities there was launched some years ago a general movement for better country roads in North Carolina. That movement is still going on with daily increasing momentum. As a result there is hardly a county in the State which has not built, or is not contemplating the building of, good macadam or sand-clay roads leading from the county seat, or principal town of the county, into its remotest agricultural districts. These main lines of good roads have secondary or "belt" roads leading into them which are also graded and made good. In a word, both the railroad and dirt road facilities in North Carolina are, in many counties, simply un-

surpassed by any State in the South and hardly equaled by any State in the Union. The farmers of North Carolina have been behind this good roads movement ever since its inception, thus showing the progressive spirit which pervades the agricultural classes of this State.

### *Telephones.*

In addition to our superb transportation facilities, rural telephones are found everywhere, thus putting the farmer in immediate communication with the markets of his own locality and with those of distant localities at a cost ranging from seventy five cents to \$1.00 per month.

### EDUCATION.

In North Carolina, as in every other state, education—agricultural education—lies at the foundation of all good and successful farming. The ignorant man can no longer “farm if he can do nothing else.” The needs of the increasing population and the demands of refined taste require that not only a greater acreage production, but that a finer quality of product be placed upon the market, and this can be done by intelligent farming only. Poor lands cannot make high average acre-yields and rich lands can not produce fine quality when manipulated by unskilled hands. Regardless of the yield per acre, there is no land so poor as that of the ignorant farmer, and none so rich as that of the man who knows how to manage his soils.

Gold mines and phosphate beds are but barren waste to the man who knows nothing of what is beneath the surface, while they are rich treasures to the man of trained mind and skilled hand. Less than forty years ago “Old Red Mountain” in Alabama was given “to boot” in a horse swap. Since then the vast deposits of iron ore stored away in those hills have built Birmingham and rolled millions upon millions of dollars into the coffers of the ironmasters. Why did not the original owner get a fortune out of these rich deposits of ore? And so it has been with the owners of many poor North Carolina farms. Hundreds of “old worn-out farms” have been sold or given to boot, as it were, by the erstwhile owners, who, failing to properly understand the local conditions and the possibilities of their acres, could not even support themselves and their families. The buyers, knowing the intrinsic value and nature of the soils, took the farms in hand for a nominal sum and have made a fortune where the original owners made a failure. The ones with their families are, perhaps, operatives in some cotton mill, while the others, with their families, are veritable lords of the land, using the cotton mill town as a market for their produce.

The locomotive existed in the mind of the inventor long before it stood upon the track. The statue always exists in the mind of the sculptor long before it emerges from the stone. So it is with the agricultural artist and the agricultural manufacturer. His ideal pork, beef, milch and draft animals, his maximum corn, wheat, and cotton crops exist in his mind months before they are found in the herd or in the field. The most fundamentally important things for farmers to possess, therefore, are not good land, good stock, good tools, good markets, and reliable labor, but correct ideals and proper vision. No castles were ever built on earth that were not first built in the air. These funda-

mental ideals come only by a careful and diligent study of the factors controlling the development of any chosen vocation.

It means little to the farmer that farm products be high-priced if his profits are consumed in hauling them to market. It means little to the farmer to own land capable of producing 50 bushels of corn to the acre if his store of knowledge allows him to gather but 10 bushels from the acre. We must, therefore, have good roads, and good schools offering efficient agricultural instruction. • But good roads and good schools alone will not make us a great agricultural state. These are but the tools with which we work. Nothing is further from the truth than the old adage that "knowledge is power." Knowledge is not power. It never has been. Power comes only as a result of an application of energy to knowledge. Every one has seen the walking encyclopedia whose brain is surcharged with facts but who never exerts any influence in his community. Every one has also seen the man of unbounded energy who didn't know what he wanted and had to have it—nervous, working, watching—always in a hurry and never getting anywhere; but when you find a man or woman possessed of great energy with an abundance of knowledge to direct it, you find a person who is a power in the land. There is not one volt more electro-motive force in the world today than there was 10,000 years ago, when it was manifested only in the thunderbolt and in the destructive shafts of lightning; but since the invention of the electric motor, even the cobbler in his shop uses the lightning as a beast of burden. The motor does not generate the power, neither does the electric current generate the power; but join the two together and every wheel in the industrial world may be propelled by the force. So it is with the farmer. When he has gained sufficient knowledge to give proper direction to his energy he will be proud to show us his fields of waving grain and his herds of fat cattle. Power, then, is ENERGIZED knowledge.

The North Carolina farmer has always had the energy, and within the last ten years he has, at a very rapid rate, been acquiring the knowledge. Twenty years ago the book farmer was looked upon as an idealist without practical ability. But conditions have changed. Since then not only have the farmers of North Carolina gone on record as favoring book farming, but have built schools and colleges for agricultural instruction, and our General Assemblies have passed laws putting agriculture into every public school in the State. At present the State Department of Agriculture, the United States Department of Agriculture, the A. and M. College, the State University, the State high schools, and practically every public school in the State are combining their efforts to dispel the mists from the eyes of the one man upon whose success the welfare of the entire State depends. Not only so, but there is a number of organizations among the farmers themselves that give promise of doing more to put farming in North Carolina on a sound business and scientific basis than any other agencies that have ever existed within our borders.

## RAW PRODUCTS.

*Corn.*

Corn grows in all parts of the State. It is our leading crop, and the yield is yearly increasing. It will be interesting to note that in 1913 the acre value of the corn crop of North Carolina was greater than that of either Georgia, Florida, Illinois, Missouri, North Dakota, South Dakota, Nebraska, Mississippi, Arkansas, Colorado, or New Mexico. Thus showing the special inducements in this State for the increased production of this crop.

Our genial climate, long growing season, and the rapidity with which the plant foods become available in the soils of the State throughout the entire year, all combine to make this crop one of especial importance both in point of yield and ease of production.

From 1870 to 1879 the average acre-yield of corn in the State was 14.7 bushels. This average persisted until 1909, when the average acre-yield of corn rose to 18.4 bushels, and in 1913 when it was 19.5 bushels per acre. The Division of Demonstration grew an average of over 44 bushels per acre on 4,800 acres of land in North Carolina in 1911. The amount of corn grown in the State in 1909 was 34,063,000 bushels and in 1910 nearly 57,139,000 bushels. The value of our corn crop in 1909 was \$28,954,000; in 1910, \$43,426,000; in 1911, \$40,738,000; in 1912, \$42,428,000; and in 1913, \$48,648,000.

TABLE No. 2—*Showing Rank of North Carolina in Corn Production in 1913 as Compared with Other States.\**

	<i>Bushels.</i>
North Carolina .....	55,282,000
Oklahoma .....	52,250,000
Virginia .....	51,480,000
Arkansas .....	47,025,000
Louisiana .....	41,800,000
South Carolina .....	38,512,000
Kansas .....	23,424,000
West Virginia .....	22,692,000
Maryland .....	22,110,000
New York .....	15,020,000
New Jersey .....	10,862,000
Florida .....	10,125,000
North Dakota .....	10,800,000
Colorado .....	6,300,000
Delaware .....	6,206,000
Connecticut .....	2,348,000
Massachusetts .....	1,944,000
California .....	1,815,000
Vermont .....	1,665,000
New Mexico .....	1,572,000
Washington .....	952,000
Montana .....	882,000
New Hampshire .....	814,000
Maine .....	608,000
Oregon .....	598,000
Wyoming .....	493,000
Arizona .....	476,000
Idaho .....	448,000
Rhode Island .....	402,000
Utah .....	340,000
Nevada .....	34,000

\*Taken from United States Year Book for 1913.

*Wheat.*

Wheat is rapidly gaining in importance as a staple crop in North Carolina. We have most excellent wheat lands in the State, but on account of the low prices of all farm products, until comparatively recently, the wheat crop has not been pushed cotton having largely taken its place even on our best wheat lands.

We can grow wheat and in large amounts. Every man remembers, when a school boy, to have had his especial attention called to California on account of its phenomenal yield of wheat, sometimes as high as 50 bushels to the acre having been reported. It is interesting to note that while the wheat crop of California has always been good, the average yield in that State has frequently fallen below the average yield in North Carolina. There have been as large yields of wheat obtained in this as, perhaps, almost any state in the Union—not yields from individual acres, but from whole farms. There is a large farm in Halifax County on which there was grown last year an average of 28½ bushels to the acre on a 140-acre field. In Johnston County a gentleman grew an average of 42 bushels to the acre on a 50-acre field, with individual acres yielding as high as 50 bushels. In Randolph County a gentleman grew an average of 27 bushels per acre on a 40-acre field. In Davidson County a farmer grew an average of over 30 bushels per acre on a 130-acre tract. But we need not multiply examples. Suffice it to say that these yields were gotten by the practice of common-sense methods on lands adapted by nature, or by preparation, to the growth of wheat. These yields may be duplicated by any farmer who has good heavy clay loam or silt loam soil and is willing to treat it properly.

The wheat crop in North Carolina in 1909 was 3,827,000 bushels; in 1910, 6,817,000 bushels; in 1911, 6,636,000 bushels; in 1912, 5,322,000 bushels; and, in 1913, 7,078,000 bushels.

TABLE No. 3.—*Showing Rank of North Carolina in Wheat Production in 1913 as Compared with Other States.\**

	<i>Bushels.</i>
North Carolina .....	7,078,000
New York .....	6,800,000
Utah .....	6,420,000
California .....	4,200,000
Wisconsin .....	3,665,000
West Virginia .....	3,055,000
Wyoming .....	2,250,000
Georgia .....	1,708,000
Delaware .....	1,638,000
New Jersey .....	1,408,000
Arkansas .....	1,313,000
New Mexico .....	1,221,000
Nevada .....	1,081,000
South Carolina .....	972,000
Arizona .....	928,000
Alabama .....	374,000
Maine .....	76,000
Vermont .....	24,000
Mississippi .....	14,000

\* Taken from United States Year Book for 1913.

*Oats.*

The oat crop in North Carolina in 1909 was 3,234,000 bushels; in 1910, 3,458,000 bushels; in 1911, 3,614,000 bushels; in 1912, 3,794,000 bushels; and in 1913, 4,485,000 bushels. The value of the oat crop in \$2,352,000; and, in 1913, \$2,736,000. \$2,352,000, and, in 1913, \$2,736,000.

TABLE NO. 4.—*Showing Rank of North Carolina in Oats Production in 1913 as Compared with Other States.\**

	<i>Bushels.</i>
North Carolina .....	4,485,000
Virginia .....	4,192,000
Utah .....	4,140,000
Kentucky .....	3,168,000
Vermont .....	3,082,000
Mississippi .....	2,800,000
West Virginia .....	2,760,000
New Jersey .....	2,030,000
New Mexico .....	1,500,000
Maryland .....	1,260,000
Louisiana .....	990,000
Florida .....	900,000
Nevada .....	473,000
New Hampshire .....	420,000
Massachusetts .....	315,000
Connecticut .....	308,000
Arizona .....	301,000
Delaware .....	122,000
Rhode Island .....	52,000

*Cotton.*

Notwithstanding we are on the northern limit of the cotton belt, a large amount of this staple crop is produced every year—indeed we have a few counties that are unexcelled in cotton production. Last year it was the boast of Robeson, one of the largest counties in the State, that it produced a bale of cotton to every man, woman, and child in it.

The cotton crop is at present the most valuable single crop in the State, ranging in value between \$50,000,000 and \$60,000,000 per annum.

The total cotton crop for North Carolina in 1906 was 579,326 bales. Since then we have gradually increased the total yield until in 1911 we produced the maximum crop in the history of the State, amounting to 1,075,826 bales. It is true that in 1911 we had greater acreage than in any other year since 1906, but the yield per acre, which should always be the basis of calculation in comparing farm crops, was considerably more than that of any other recognized cotton-growing State in the Union. We, are, therefore, not only increasing the total yield of this product, but we seem to be doing better farming than we have done in past years.

\* Taken from United States Year Book for 1913.

TABLE No 5.—*Showing Average Acre Yield of Cotton in North Carolina in 1913 as Compared with Other States.\**

	Pounds.
North Carolina .....	239
South Carolina .....	235
Tennessee .....	210
Georgia .....	208
Arkansas .....	205
Mississippi .....	204
Alabama .....	190
Texas .....	150
Florida .....	150
Oklahoma .....	132

*Live Stock.*

The number of live stock in North Carolina could be greatly increased to the advantage of every farmer in the State. We have not nearly as much live stock as our farms require; and the quality is very inferior to that which could be desired. Nevertheless, within the last ten years the percentage of increase of live stock in North Carolina has been greater than that of any of the thirty-eight states shown in the following table. A glance at the table will show that the percentage of increase of live stock in North Carolina in the last ten years has been more than double that of New York, Iowa, Colorado, Pennsylvania, Kansas, Texas, and West Virginia, and considerably more than that of Missouri, Michigan, Wisconsin and Illinois.

In 1913 North Carolina had 312,000 milch cows and 92,000 other cattle. There were 181,000 sheep on the farms and 1,335,000 hogs.

TABLE No. 6.—*Showing Percentage Increase in Number of Live Stock in North Carolina as Compared with Other States—1900-1910.\**

North Carolina .....	108.1
Arkansas .....	97.6
South Dakota .....	95.2
California .....	89.6
Florida .....	84.4
Tennessee .....	82.0
Alabama .....	81.7
Minnesota .....	81.5
Virginia .....	78.2
Missouri .....	78.0
Mississippi .....	76.4
Oregon .....	75.3
Michigan .....	74.3
Arizona .....	67.6
Wyoming .....	67.6
Delaware .....	64.6
Wisconsin .....	64.2
Montana .....	64.2
Illinois .....	59.4
Kentucky .....	59.3
Indiana .....	58.7
Oklahoma .....	58.4
Nevada .....	57.9
Ohio .....	56.7
Maryland .....	56.2

\* Taken from United States Year Book for 1913.

Louisiana .....	54.8
Nebraska .....	52.9
Maine .....	47.1
New York .....	45.8
West Virginia .....	41.8
Iowa .....	40.9
Colorado .....	40.5
New Jersey .....	39.6
Pennsylvania .....	38.1
New Mexico .....	37.1
Utah .....	34.0
Kansas .....	32.8
Texas .....	32.5
Massachusetts .....	31.3
Connecticut .....	29.6
Vermont .....	26.9
Rhode Island .....	26.3
District of Columbia .....	22.0
New Hampshire .....	12.8

### MANUFACTURED PRODUCTS.

In 1904 the State of North Carolina had 3,272 manufacturing establishments, which gave employment to an average of 93,142 persons during the year and paid \$25,170,000 in salaries and wages. In 1909 there were 49,931 manufacturing establishments, giving employment to 133,453 persons and paying out during the year \$41,259,000 in salaries and wages. This shows the rate at which manufacturing enterprises are increasing in this State. The value of the total manufactured products of the State in 1910 was \$216,656,000, which was over \$13,500,000 more than Georgia, our closest competitor in the South. The following table will show at a glance how North Carolina ranks as a manufacturing state. While it is not the first in value of manufactured products it is ahead of a great many others.

TABLE No. 7.—*Showing Rank of North Carolina in Manufactured Products as Compared with Other States in 1910.*

North Carolina .....	\$216,656,000
Georgia .....	202,863,000
Nebraska .....	199,019,000
Tennessee .....	180,217,000
Maine .....	176,029,000
New Hampshire .....	164,581,000
West Virginia .....	161,950,000
Alabama .....	145,962,000
Colorado .....	130,044,000
South Carolina .....	113,236,000
Oregon .....	93,005,000
Mississippi .....	80,555,000
Arkansas .....	74,916,000
Montana .....	73,272,000
Florida .....	72,890,000
Vermont .....	68,310,000
Utah .....	61,989,000
Oklahoma .....	53,682,000
Delaware .....	52,840,000
Arizona .....	50,267,000
District of Columbia .....	25,289,000
Idaho .....	22,400,000
North Dakota .....	19,138,000

South Dakota .....	17,870,000
Nevada .....	11,887,000
New Mexico .....	7,898,000
Wyoming .....	6,249,000

No state can turn out such an enormous amount of manufactured products without taxing to the utmost its agricultural resources. Cotton and other raw materials for manufacture, and for food supplies for men and necessary teams, must be produced on the farms, or imported from other states.

While the North Carolina farmer has made long and rapid strides in every line of agricultural development in the recent past, he is going to make even greater progress in the near future. The inducements for greater efforts are here. Our home markets are calling for more than we can produce with our present methods, and our neighboring markets are yet not fully supplied.

By the introduction of improved implements and the most approved methods of tillage, fertilization, etc., the present annual crop yields can be more than doubled, and there is little doubt that they will be more than doubled in the near future. But even then, it is not likely that our present farming population can nearly supply the demands made on them for food and feed products. As our crop yields increase, the demand for the additional output will likewise increase. It would seem, therefore, that a very material addition to our farming population is imperative.

We have 22,439,129 acres of land in farms in North Carolina. Of this amount of land, only 8,813,056 acres are improved. This leaves 13,626,073 acres of unimproved land in farms. It is evident that this vast territory of nonproductive land should be brought under cultivation and made to contribute its share to the wealth of the State, and to do this would require about twice our present farming population.

As pointed out above, our markets are calling for more than we are producing, and, as a consequence, millions upon millions of dollars worth of food and feed products are yearly being shipped into the State from outside sources.

#### **FOOD PRODUCTS SHIPPED INTO THE STATE OF NORTH CAROLINA DURING 1913.**

Three years ago the Division of Botany and Agronomy was directed to ascertain, as far as possible, the amount of food and feed products shipped into the State during 1911. The results of that investigation showed that around \$39,000,000 worth of these products were shipped into North Carolina during that year. This year, 1914, the Commissioner of Agriculture again directed this Division to make a similar investigation for the same purpose. Using the same method of investigation as we used before, we addressed a letter to each of the railroad companies operating inter-state lines of railroad, asking them to furnish us with such data as might be available to show the amount of various food and feed products shipped into the State over their lines during 1913.

We are pleased to state that all of the leading lines of railroads responded promptly to this request, except one, and gave us figures

taken directly from their books. The Seaboard Air Line and four short lines of railroad failed to give us the data requested, and we were forced to estimate the products shipped in over these short lines in 1913 as the same as that shipped in over them during 1911. Since the Coast line and the Seaboard Air Line traverse pretty much the same territory we felt justified in estimating the shipments over these two lines as being about equal. This enables us to present fairly reliable data showing the amount of food and feed products shipped into the State over the different lines of railroads during 1913.

#### *Southern Railway.*

During the year 1913 the Southern Railway shipped into the territory traversed by its lines 3,347,064 bushels of corn; 142,065 bushels of wheat; 59,010 barrels of apples; 5,530,000 pounds of cured meat; 15,392,000 pounds of dressed beef; 2,880 cases of canned goods; 15,825,000 pounds of vegetables; 16,512 tons of hay, and 779 tons of feed-stuffs.

#### *Norfolk and Western Railroad.*

The Norfolk and Western Railroad shipped into the territory traversed by its lines during 1913, 2,712,292 bushels of corn; 435,078 bushels of wheat; 263,567 bushels of oats; 8,607 barrels of apples; 69,188 pounds of dried fruit; 1,529,088 pounds of cured meat; 895,886 pounds of fresh pork; 21 barrels of barreled pork; 1,157,792 pounds of dressed beef; 2,222 pounds of corned beef; 2,955 pounds of butter; 113,631 pounds of cheese; 24,571 cases of canned goods; 47,124 gallons of syrup; 2,621 pounds of honey; 2,783 tons of hay; 10,578 tons of feedstuffs, and 2,650 dozen of eggs.

#### *Winston-Salem Southbound.*

During the year 1913 this branch of the Norfolk and Western shipped into middle North Carolina 11,389 bushels of corn; 20,830 bushels of wheat; 53,860 bushels of oats; 611 barrels of apples; 16,065 pounds of dried fruit; 109,051 pounds of cured meat; 20,000 pounds of fresh pork; 2,000 pounds of corned beef; 1,350 pounds of butter; 8,050 pounds of cheese; 6,278 cases of canned goods; 14,800 gallons of syrup; 862 pounds of honey; 1,182 tons of hay; 866 tons of feedstuff, and 264 dozen eggs.

#### *Atlantic Coast Line.*

This road shipped into Eastern North Carolina during the year 1913 1,773,936 bushels of corn; 1,649,850 bushels of wheat in the form of flour, and 29,570 tons of hay.

#### *Norfolk Southern Railway.*

This road shipped into Eastern North Carolina during 1913 726,056 bushels of corn; 1,070,541 bushels of wheat in the form of flour; 47,023 tons of mill feed; 17,857 tons of hay; 940,000 pounds of dressed meat; 13,078,000 pounds of other packing-house products and 2,762,000 pounds of other animal products as leather, hides, butter, eggs, etc.

*Seaboard Air Line Railway.*

The estimated amounts of products shipped into that part of the State traversed by this system during 1913 were 1,773,936 bushels of corn; 1,649,850 bushels of wheat and 29,570 tons of hay.

*Mount Airy and Eastern Railway.*

This road shipped into the State from the North and West during 1913, 12 bushels of corn; 242 barrels of apples; 2,300 pounds of dried fruit; 53 cases of canned goods; 150 pounds of pork, and 99 bushels of potatoes.

*East Tennessee and Western North Carolina Railroad.*

This railroad shipped into the mountain section of North Carolina during 1913 25,952 bushels of corn; 115 bushels of wheat; 13,576 bushels of oats; 10,466 barrels of flour; 60 barrels of apples; 120 pounds of dried fruit; 232,231 pounds of cured meat; 1,847 pounds of fresh pork; 1,149 pounds of dressed beef; 830 pounds of canned beef; 160 pounds of butter; 8,373 pounds of cheese; 3,808 cases of canned goods; 38 gallons of syrup; 3,659 pounds of honey; 140 pounds of vegetables; 241 tons of hay, and 802 tons of feedstuff. Estimated for 1913.

*Danville and Western Railway.*

It is estimated that this road shipped into Rockingham County during 1913 17,835 bushels of corn; 30,104 bushels of wheat; 7,161 bushels of oats; 111,138 barrels of flour; 1,348 barrels of apples; 6,050 pounds of dried fruit; 133,528 pounds of cured meat; 4,600 pounds of fresh pork; 2,000 barrels of barreled pork; 3,580 pounds of corned beef; 872 pounds of butter; 157,666 pounds of cheese; 6,591 cases of canned goods; 9,500 gallons of syrup; 1,638 pounds of honey; 96,000 pounds of vegetables and 2,240 tons of hay and 1,045 tons of feedstuff.

*Tallulah Falls Railway.*

It is estimated that this short line of railroad shipped into Western North Carolina during the period under discussion 7,643 bushels of corn; 3,397 barrels of flour; 492,000 pounds of cured meat; 26 tons of hay, and 85 tons of feedstuff.

*Carolina, Clinchfield and Ohio Railway.*

It is estimated that the Carolina, Clinchfield and Ohio Railway shipped into Northwestern North Carolina during 1913 50,526 bushels of corn; 173 bushels of wheat; 9,211 bushels of oats; 12,600 barrels of flour; 52 barrels of apples; 182,925 pounds of cured meat; 3,606 pounds of fresh pork; 15 barrels of barreled pork; 450 pounds of dressed beef; 30,051 pounds of corned beef; 215 pounds of butter; 7,043 pounds of cheese; 14,718 cases of canned goods; 1,908 pounds of honey; 9,066 tons of hay, and 4,939 tons of feedstuff.

SHOWING AMOUNT OF FOOD AND FEED PRODUCTS SHIPPED INTO NORTH  
CAROLINA DURING 1913.

Railroad	Corn (Bushels)	Wheat (Bushels)	Oats (Bushels)	Apples (Barrels)	Dried Fruit (Pounds)	Dried Meat (Pounds)
Southern.....	3,347,064	142,065		59,010		5,530,000
Norfolk & Western.....	271,292	435,078	263,567	8,607	69,788	1,529,088
Norfolk Southern.....	726,056	1,070,541				
Atlantic Coast Line.....	1,773,936	1,649,850				
Seaboard Air Line.....	1,773,936	1,649,850				
Car. Clinchfield & Ohio*.....	50,526	63,173	9,211	52		182,925
Winston-Salem Southbound.....	11,389	20,830	53,860	611	16,065	109,051
E. Tenn. & W. N. C.....	25,952	52,445	13,576	60	120	232,231
Danville & Western*.....	17,835	585,830	7,161	1,348	6,050	133,528
Mount Airy & Eastern.....	12			242	2,300	
Talulah Falls Ry.*.....	7,643	16,985				492,000
Totals.....	8,005,641 @ 80c \$6,404,672.80	5,686,647 @ \$1.00 \$5,686,647.00	347,375 @ 50c \$173,687.50	69,930 @ \$5.00 \$349,650.00	94,323 @ 10c \$9,432.30	8,208,823 @ 12½ c \$1,027,102.87

\*Estimated to be same as 1911.

Railroad	Fresh Pork (Pounds)	Barreled Pork (Barrels)	Dressed Beef (Pounds)	Corned Beef (Pounds)	Butter (Pounds)
Southern.....			15,392,000		
Norfolk & Western.....	895,886	21	1,157,792	20,222	2,955
Norfolk Southern.....			940,000		
Atlantic Coast Line.....					
Seaboard Air Line.....					
Carolina, Clinchfield & Ohio*.....	3,606	15	450	30,051	215
Winston-Salem South Bound.....	20,000			2,000	1,350
E. Tenn. & W. N. C.*.....	1,847		1,149	830	160
Danville & Western*.....	4,600	2,000		3,580	872
Mt. Airy & Eastern.....	150				
Tallulah Falls Ry.*.....					
Totals.....	926,089 @ 10c \$92,608.90	2,036 @ \$25 \$50,900.00	17,491,391 @ 9c \$1,574,225.19	56,683 @ 12½c \$7,085.25	5,552 @ 20c \$1,110.40

\*Estimated to be same as 1911.

Railroads	Cheese (Pounds)	Canned Goods (Cases)	Syrup (Gallons)	Honey (Pounds)	Vege- tables (Pounds)	Hay (Tons)
Southern.....		2,880			15,825	16,512
Norfolk & Western.....	113,631	24,571	47,124	2,621	15,825	2,783
Norfolk Southern.....						17,857
Atlantic Coast Line.....						29,570
Seaboard Air Line.....						29,570
Car., Clinchfield & Ohio*....	7,043	14,718		1,908		9,066
Winston-Salem Southbound.....	8,050	6,278	14,800	862		1,182
E. Tenn. & W. N. C.*.....	8,373	3,808	38	3,659	140	241
Danville & Western*.....	157,666	6,591	9,500	1,638	96,000	2,240
Mt. Airy & Eastern.....		53			4,954	
Talulah Falls Ry.*.....						26
Totals.....	294,763 @ 12½c \$36,845.37	58,899 @ \$2.50 \$147,247.50	71,462 @ 40c \$28,584.80	10,688 @ 10c \$1,068.80	132,740 @ 5c \$6,637.00	108,047 @ \$20 \$2,160,940.00

\*Estimated to be same as 1911.

Railroad	Feed Stuffs (Tons)	Miscellaneous Packinghouse Products (Pounds)
Southern.....	779	
Norfolk & Western.....	10,578	
Norfolk Southern.....	47,023	13,078,000
Atlantic Coast Line.....		
Seaboard Air Line.....		
Carolina, Clinchfield & Ohio*.....	4,839	
Winston-Salem Southbound.....	866	
East Tennessee & Western North Carolina*.....	802	
Danville & Western*.....	1,045	
Mt. Airy & Eastern.....		
Talulah Falls Ry.*.....	85	
Totals.....	66,017 @ \$25 \$1,650,425.00	13,078,000 @ 10c \$1,307,800.00

\*Estimated to be same as 1911.

TABLE NO. 9.—*Showing Comparative Values of Food and Feed Products Shipped Into North Carolina During 1911 and 1913.*

	1911.	1913.
Corn @ 80c. bushel .....	\$4,346,420.80	\$6,404,672.80
Wheat @ \$1.00 a bushel.....	4,378,316.00	5,686,647.00
Oats @ 50c. a bushel .....	119,966.00	173,687.00
Apples @ \$5.00 a barrel .....	357,105.00	349,650.00
Dried fruit @ 10c. a pound .....	19,420.30	9,432.30
Cured meat @ 12½c. a pound.....	6,666,429.62	1,027,102.87
Fresh pork @ 10c. a pound .....	37,664.30	92,608.90
Barreled pork @ \$25 a barrel of 200 pounds..	55,875.00	50,900.00
Dressed Beef @ 12½c. a pound.....	12,937.00	7,085.25
Miscellaneous packing house products @ 10c. ....	.....	1,307,800.00
Butter @ 20c. a pound.....	875.20	1,110.40
Cheese @ 12½c. a pound .....	39,057.37	36,845.37
Canned goods @ \$2.50 a case.....	116,257.50	147,247.50
Syrup @ 40c. a gallon .....	21,110.80	28,584.80
Honey @ 10c. a pound .....	789.50	1,068.80
Vegetables @ 5c. a pound .....	3,516,716.45	6,637.00
Hay @ \$20 a ton .....	15,607,820.00	2,160,940.00
Feed stuffs—bran, shorts etc., @ \$25 a ton...	2,225,625.00	1,650,425.00
Total .....	\$39,640,885.55	\$20,716,671.68
Balance in favor of 1913.....		\$19,124,213.87

The above figures, most of which were taken direct from the books of the different railroad companies doing an inter-state business, seem to be the closest approximation possible to the actual facts, and while it is not claimed that these figures are within even a million dollars of correct, due to the impracticability of getting any but the leading items of import, they still show that the state has decreased its imports enormously within the last three or four years, and is thus waking to the possibility and necessity of producing its own food supplies. Our people are beginning to live at home.







# THE BULLETIN

OF THE

## NORTH CAROLINA

### DEPARTMENT OF AGRICULTURE,

RALEIGH.

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#### FIFTEENTH ANNUAL REPORT

ON

### FOOD ADULTERATION

UNDER THE PURE FOOD LAW

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†T. E. BROWNE.....	Assistant in Charge of Boys' Clubs.
†A. K. ROBERTSON.....	Assistant in Charge of Boys' Clubs.
†MRS. JANE S. MCKIMMON.....	Assistant in Charge of Girls' Clubs.
†MISS MARGARET SCOTT.....	Assistant in Girls' Clubs.

F. N. McDOWELL, Assistant Director Edgecombe Test Farm, Rocky Mount, N. C.

F. T. MEACHAM, Assistant Director Iredell Test Farm, Statesville, N. C.

JOHN H. JEFFERIES, Assistant Director Pender Test Farm, Willard, N. C.

F. S. PUCKETT, Assistant Director Transylvania and Buncombe Test Farms, Swannanoa, N. C.

E. G. MOSS, Assistant Director Granville Test Farm, Oxford, N. C.

\*Assigned by the Bureau of Soils, United States Department of Agriculture.

†Assigned by the Bureau of Animal Husbandry, United States Department of Agriculture.

‡In cooperation with Bureau of Plant Industry, United States Department of Agriculture.

## LETTER OF TRANSMITTAL.

HON. W. A. GRAHAM,  
*Commissioner of Agriculture,*  
*Raleigh, N. C.*

November 1, 1914.

SIR:—I submit herewith manuscript covering the investigations that have been made during the past year under the State Food Law, Chapter 368, Laws of 1907. I recommend its publication as the December BULLETIN and Fifteenth Annual Food Report.

Respectfully submitted,

W. M. ALLEN,  
*State Food and Oil Chemist.*

Approved:

W. A. GRAHAM,  
*Commissioner of Agriculture.*



# REPORT ON FOOD ADULTERATION FOR 1914.

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By W. M. ALLEN, STATE FOOD AND OIL CHEMIST,

ASSISTED BY

E. W. THORNTON, ASSISTANT CHEMIST,

C. E. BELL, ASSISTANT CHEMIST.

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Report on Food Adulteration and the Enforcement of Food Law for 1914—the fifteenth annual report on the subject.

## THE ENFORCEMENT OF THE LAW.

The State Food Law, chapter 368, Public Laws of North Carolina, 1907, makes it the duty of the State Department of Agriculture to enforce the food law. The law provides that the Board of Agriculture shall adopt and publish standards of strength and purity for food products and regulations for the enforcement of the law. Such standards and regulations have been adopted and published in the Annual Food Reports from time to time, as well as in pamphlet form, and have been sent to the dealers of the State, and will be sent on application to any citizen of the State.

The Department has spent a great deal of time and money during the past fourteen years trying to show the dealers of the State the requirements of the food law and how to comply with the same. As the dealers have now had time and opportunity to know the law and its requirements, it will be the policy of the Department to prosecute cases when similar ones have in the past been dismissed because of lack of information on the part of the dealer in regard to the law and its requirements.

## EXTRACT FROM FOOD LAW.

### NOTE ON.

The following extract from the Pure Food Law is very important, and the same is herewith printed in order that the grocery men may become more familiar with the requirements of the law.

State Food Law, section 6, defines and describes what constitutes food adulteration. Section 7 defines and describes what constitutes the misbranding of food products. Section 9 provides for a guaranty by which the retail dealer may be exempt from prosecution for violation of the law.

### EXTRACT FROM FOOD LAW.

SEC. 6. That for the purpose of this act an article shall be deemed to be adulterated, in the case of food—

First. If any substance has been mixed or packed with it so as to reduce or lower or injuriously affect its quality or strength.

Second. If any substance has been substituted, wholly or in part, for the article.

Third. If any valuable constituent of the article has been wholly or in part abstracted.

Fourth. If it be mixed, colored, powdered, coated, or stained in a manner whereby damage or inferiority is concealed.

Fifth. If it contains any added poisonous or other added deleterious ingredient which may render such article injurious to health. If it contains any of the following substances, which are hereby declared deleterious and dangerous to health when added to human food, to wit: colors which contain antimony, arsenic, barium, lead, cadmium, chromium, copper, mercury, uranium, or zinc; or the following colors: gamboge, corallin, picric acid, aniline, or any of the coal-tar dyes; saccharine, dulcin, glucin, or any other artificially or synthetically prepared substitute for sugar; paraffin, formaldehyde, beta-naphthol, abristol, benzoic acid or benzoates, salicylic acid or salicylates, boric acid or borates, sulphurous acid or sulphites, hydrofluoric acid or any flourine compounds, sulphuric acid or potassium sulphate or wood alcohol: *Provided*, that catsups and condimental sauces may, when the fact is plainly and legibly stated in the English language on the wrapper and label of the package in which it is retailed, contain not to exceed two-tenths of one per cent of benzoic acid or its equivalent in sodium benzoate. Fermented liquors may contain not to exceed two-tenths of one per cent of combined sulphuric acid, and not to exceed eight-thousandths of one per cent of sulphurous acid.

Sixth. If it consists in whole or in part of a filthy, decomposed, or putrid animal or vegetable substance, or any portion of an animal unfit for food, whether manufactured or not, or if it is the product of a diseased animal or one that had died otherwise than by slaughter. In addition to the ways already provided, sausage shall be deemed to be adulterated if it is composed in any part of liver, lungs, kidneys, or other viscera of animals: *Provided*, that the use of animal intestines as sausage casings shall not be deemed to be an adulteration.

Seventh. If it differs in strength, quality, or purity from the standards of purity of food products that have been or may be from time to time adopted by the Board of Agriculture.

SEC. 7. That the term "misbranded," as used herein, shall apply to all drugs or articles of food, or articles which enter into the composition of food, the package or label of which shall bear any statement, design, or device regarding such article or the ingredients or substances contained therein which shall be false or misleading in any particular, and to any food or drug product which is falsely branded as to the State, Territory, or country in which it is manufactured or produced.

That for the purpose of this act an article shall also be deemed to be misbranded, in the case of food—

First. If it be an imitation of or offered for sale under the distinctive name of another article.

Second. If it be labeled or branded so as to deceive or mislead the purchaser, or purport to be a foreign product when not so, or if the contents of the package as originally put up shall have been removed, in whole or in part, and other contents shall have been placed in such package, or if it fail to bear a statement on the label of the quantity or proportion of any morphine, opium, cocaine, heroin, alpha or beta eucaine, chloroform, canabis indica, chloral, hydrate or acetanilide, or any derivative or preparation of any such substances contained therein.

Third. If in package form, and the contents are stated in terms of weight or measure, they are not plainly and correctly stated on the outside of the package.

Fourth. If the package containing it or its label shall bear any statement, design, or device regarding the ingredients or the substances contained therein which statement, design, or device shall be false or misleading in any particu-

lar: *Provided*, that an article of food which does not contain any added poisonous or deleterious ingredients shall not be deemed to be adulterated or misbranded in the following cases:

First. In the case of mixtures or compounds which may be now or from time to time hereafter known as articles of food under their own distinctive names, and not an imitation of or offered for sale under the distinctive name of another article, if the name be accompanied on the same label or brand with a statement of the place where said article has been manufactured or produced.

Second. In the case of articles labeled, branded, or tagged so as to plainly indicate that they are compounds, imitations, or blends, and the word "compound," "imitation," or "blend," as the case may be, is plainly stated on the package in which it is offered for sale: *Provided*, the labeling is according to the rules prescribed by the Board of Agriculture: *Provided*, that the term "blend," as used herein, shall be construed to mean a mixture of like substances, not excluding harmless coloring or flavoring ingredients used for the purpose of coloring and flavoring only.

SEC. 9. That no dealer shall be prosecuted under the provisions of this act when he can establish a guaranty signed by the wholesaler, jobber, manufacturer, or other party, residing in North Carolina, from whom he purchased such article, to the effect that the same is not adulterated or misbranded within the meaning of this act, designating it.

#### REGULATION ON LABELING.

A label must be, as far as possible, attached to each package, and contain, in addition to other information, the name of the material, the name and address of the manufacturer, importer, or jobber. When the words "artificial," "imitation," "compound," "adulterated," or other words of similar import, are required, they must be on the principal label and immediately precede or follow the word or words they modify, which must be the principal word or words of the label, and be in at least half the size and same style of type and on the same kind of background as the word or words with which they are closely associated. The principal words in the label must be printed in either dark-colored letters on a light-colored background or light-colored letters on a dark-colored background. Any statement that is required on the principal label of a barrel or cask of molasses, molasses compound, sirup or compound sirup, vinegar or compound vinegar, must appear on one end or head of the barrel or cask; and if the principal label or any part of it appears on both ends of barrel or cask, they shall be identical, one to the other.

The label on bottled soft drinks must bear the name and address of the bottler.

Where the presence of preservatives, coloring matter, or other substance or substances is required to be printed on the label, the printing must be done clearly and conspicuously on the label, in type not smaller than *brevier heavy gothic caps*, and on the same kind of background as the rest of the label.

Retail dealers, while offering food or beverage for sale, must keep the label so that it may be seen by purchaser or inspector, and the label must be kept so that it will remain legible.

## NOTICE TO LOCAL DEALERS.

The attention of local dealers is especially called to the sale of compounds and imitations as straight food products. The sale of a compound or imitation food product is legal, provided it contains nothing deleterious to health and is sold under its own name as a compound or imitation, as the case may be. But the sale of a compound vinegar or of an imitation or spirit vinegar as vinegar is a violation of the law.

The sale of butterine or renovated butter as butter is a violation of the law.

The sale of a compound coffee and chicory as coffee is a violation of the law.

The sale of a compound sirup or a mixture of glucose or corn sirup and refiners' sirup as sirup is a violation of the law.

The sale of filled cheese, or skim-milk cheese, or cheese below standard in milk fat as cheese is a violation of the law.

The sale of compound ice-cream or an ice-cream below standard in butter fat as ice-cream, without making the fact known to the purchaser, is a violation of the law.

The sale of canned vegetables colored with copper sulphate is a violation of the law.

The attention of dealers is again especially called to the definitions and standards for the above products, reported elsewhere in this BULLETIN.

## WORK OF THE YEAR 1914.

During the year, 1,323 samples of foods and beverages have been analyzed.

## SUMMARY OF RESULTS OF THE EXAMINATION OF FOOD PRODUCTS.

Name of Sample.	Number of Samples Examined.
Beers and imitation and near-beers*.....	34
Butter and butter substitutes.....	29
Cheese and skim-milk cheese.....	38
Cider and imitation ciders.....	26
Cinnamon extract.....	5
Currants, figs, dates, and raisins.....	30
Coffee and coffee substitutes.....	58
Fish, salt mullets.....	10
Ice-cream and ice-cream substitutes.....	165
Lard and lard compounds.....	15
Lemon extracts and lemon extract substitutes.....	86
Maple sirups and maple sirup substitutes.....	27
Milk and cream.....	110
Milk, condensed.....	29
Miscellaneous samples.....	20
Molasses and sirups.....	185
Olive oils.....	6
Orange extract and substitutes.....	7
Peas, canned.....	23
Peppermint extract.....	6
Rice.....	10
Sweet oils and substitutes.....	29
Vanilla extracts and substitutes.....	64
Vinegar and vinegar substitutes.....	311
Total.....	1,323

\*Examined for alcohol only.

## BEERS, IMITATION AND NEAR-BEERS.

## DEFINITIONS AND STANDARDS.

Malt liquor is a beverage made by the alcoholic fermentation of an infusion, in potable water, of barley malt and hops, with or without unmalted grains.

Beer is a malt liquor produced by bottom fermentation, and contains not less than 5.00 per cent of extractive matter and 0.16 per cent of ash, chiefly potassium phosphate, and not less than 2.75 per cent of alcohol by volume.

Lager beer is beer which has been stored in casks for a period not less than three months, and contains not less than 3.00 per cent of alcohol by volume.

## RESULTS OF THE EXAMINATION OF

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.
12955	Beer, Imitation.....	Council Bluffs Soda Water Co., Council Bluffs, Iowa.....
13049	.....do.....	Washington Brewery Co., Washington, D. C.....
13928	Beer.....	.....
13283	.....do.....	Gottlieb-Bauernschmidt-Strauss Brewing Co., Baltimore, Md.....
13284	.....do.....	.....do.....
13285	.....do.....	.....do.....
13168	Beer, Near.....	Southern Bottling Co., Baltimore, Md.....
13162	.....do.....	.....do.....
13064	.....do.....	.....do.....
13938	Beer, Imitation.....	S. R. B. Association, Council Bluffs, Iowa.....
13930	Beverage, Temperance.....	Washington Brewery Co., Washington, D. C.....
12925	Beer, Temperance.....	Southern Bottling Co., Baltimore, Md.....
12798	Beer.....	.....
14178	.....do.....	Southern Bottling Co., Baltimore, Md.....
14175	Beer, Near.....	.....do.....
14176	Beer.....	.....do.....
14177	Beer, Near.....	.....do.....
13953	Beer, Imitation.....	Pabst Brewery Co., Milwaukee, Wis.....
12801	.....do.....	Washington Brewing Co., Washington, D. C.....
12800	Beer.....	.....
13576	Beer, Near.....	.....
13931	Beverage, Temperance.....	Washington Brewing Co., Washington, D. C.....
13059	Beer, Imitation.....	.....do.....
13060	.....do.....	Sanalco Bottling Co., Norfolk, Va.....
13289	.....do.....	Coöperative Fruit Juice Corporation, Norfolk, Va.....
13290	.....do.....	Robert Portner Brewing Co., Alexandria, Va.....
13582	.....do.....	National Beverage Co., Chattanooga, Tenn.....
13436	.....do.....	.....
13437	.....do.....	.....
13288	Beverage, Fermented Malt.....	Frank Steil Bottling Dept., Baltimore, Md.....
13287	.....do.....	.....do.....
13063	Beer.....	.....
13932	Beverage, Malt Brew.....	.....
13050	Beer, Home-made.....	.....

The presence of alcohol in these products is not objectionable under the food law, and, therefore, no official samples were examined.

The samples, the results of the examination of which are published in table below, were sent to the Department for analysis by county and city officials whose duty it is to enforce the prohibition law. This Department has no authority or funds for work under the latter law, and only determines the alcohol in samples for the above officials to assist them in the performance of their duties.

As the samples were not official under the Food Law, they were only tested for alcohol, as requested by the officials who sent them to the Department.

## BEERS, IMITATION AND NEAR-BEERS.

Laboratory Number.	Retail Dealer or Party Who Sent Sample for Analysis.	Alcohol, Per Cent (by Volume).	Remarks and Conclusions.
12955	Ahrens Bros., Wilmington.....	0.10	Imitation beer; sale illegal.
13049	S. J. Betts, Raleigh.....	None	Imitation beer.
13928	H. F. Brooks, Smithfield.....	4.66	Beer; sale illegal.
13283	F. F. Brown, Policeman, Raleigh.....	4.62	do.
13284	.....do.....	4.67	do.
13285	.....do.....	4.52	do.
13168	J. B. Burroughs, Dabney.....	2.00	Near-beer; sale illegal.
13162	.....do.....	1.62	do.
13064	R. G. Burroughs, Henderson.....	2.23	do.
13938	R. N. Cook, Sheriff, Graham.....	0.22	Imitation beer; sale illegal.
13930	Otho Curl, Creedmoor.....	1.45	Near-beer; sale illegal.
12925	E. L. Gavin, Roseboro.....	1.85	do.
12798	W. J. May, Mayor, Spring Hope.....	2.80	Beer of low order; sale illegal.
14178	Chief of Police, Murphy.....	4.08	Beer; sale illegal.
14175	.....do.....	1.96	Near-beer; sale illegal.
14176	.....do.....	4.27	Beer; sale illegal.
14177	.....do.....	1.95	Near-beer; sale illegal.
13953	Chief of Police, Plymouth.....	0.17	Imitation beer; sale illegal.
12801	J. A. Pope, Policeman, Raleigh.....	0.17	do.
12800	.....do.....	3.57	Beer; sale illegal.
13576	R. H. Salsbury, Hassell.....	1.44	Near-beer; sale illegal.
13931	Herbert Smith, Littleton.....	0.40	Imitation beer; sale illegal.
13059	J. U. & S. T. Smith, Raleigh.....	0.22	Imitation beer.
13060	.....do.....	0.07	do.
13289	C. S. Smith, Ayden.....	1.62	Near-beer; sale illegal.
13290	.....do.....	0.12	Imitation beer.
13582	J. F. Spruill, Lexington.....	0.25	Imitation beer; sale illegal.
13436	W. B. Strickland, Jr., Scotland Neck.....	0.22	Imitation beer; claims food value that it does not contain; misbranded; sale illegal.
13437	.....do.....	0.18	Imitation beer; sale illegal.
13288	W. J. Tate, Otila.....	-----	Imitation beer.
13287	.....do.....	-----	do.
13063	Mayor, Weldon.....	3.17	Beer; sale illegal.
13932	.....do.....	2.12	Near-beer; sale illegal.
13050	D. O. Wilkins, Sheriff, Shelby.....	2.57	do.

## BUTTER AND BUTTER SUBSTITUTES.

## DEFINITIONS AND STANDARDS.

Butter is the clean, nonrancid product made by gathering in any manner the fat of fresh or ripened milk or cream into a mass, which also contains a small portion of the other milk constituents, with or without salt, and contains not less than 82.50 per cent of milk fat and not more than 16 per cent of water.

Renovated butter, process butter, is the product made by melting butter and working, without the addition or use of chemicals or any substance except milk, cream, or salt, and contains at least 82.50 per cent of milk fat and not more than 16 per cent of water.

Oleomargarine, oleo or butterine, is a substitute for butter, made from other and cheaper fats than butter.

Of the 29 samples of butter and butter substitutes examined, seven were renovated or process butter. Of the 7 samples of process or renovated butter examined, one was sold as process butter and the other six were sold as butter or tub butter, in violation of the food law. In the above six cases the inspector asked for butter or tub butter. Instead

## RESULTS OF THE EXAMINATION OF

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
12953	Cloverbloom.....	Butter.....	Armour & Co., Chicago, Ill.....	R. A. Montgomery, Wilmington.
12783	Yellow Rose.....	do.....	H. L. Belote & Co., Norfolk, Va.	W. H. Johnson, Greenville..
12948	.....	Butter, Country..	John Best, Clinton, N. C., R. 3.	Herrin & Bass, Clinton.....
13215	Blue Valley.....	Butter.....	Blue Valley Creamery Co., Norfolk, Va.	S. C. Turnage, Smithfield..
12784	do.....	do.....	do.....	W. H. Johnson, Greenville..
13245	.....	do.....	.....	A. S. Capehart, Ronda.....
13220	Process Butter.....	Butter, Tub.....	Christian & Munn, Rocky Mount, N. C.	Joyner & Robbins, Rocky Mount.
13217	.....	Butter, Country..	Doc. Elmo, Dunn, N. C.....	R. S. Jernegan, Dunn.....
13222	Process Butter.....	Butter, Tub.....	Fox River Butter Co., Norfolk, Va.	R. C. Brown, Tarboro.....
13214	.....	Butter.....	Friedman Mfg. Co., Norfolk, Va.	Peedin & Peterson, Smithfield.
12958	Friedman's Fancy Process Butter.	Process Butter.....	do.....	Johnson & McCullers, Raleigh.
12957	do.....	Butter, Pure.....	do.....	W. B. Mann & Co., Raleigh.
12782	Green Leaf Clover, Fancy.	Butter.....	do.....	W. R. Brothers, Edenton...
12944	Sulby Lodge Farm, Pure Guernsey.	do.....	James O. Gardner, Charlotte, N. C.	S. R. Lentz, Charlotte.....
12954	.....	Butter, Country..	W. J. Glass, Concord, N. C.....	F. S. Orr, Maxton.....

of getting butter, as asked for, he received process or renovated butter, without any statement to that effect being made.

It seems to be quite a custom among the retail dealers of the State to buy process or renovated butter, plainly labeled process butter, and to sell it at retail from the original package as butter.

The United States Department of Agriculture has amended Regulation 21, governing the labeling of renovated butter, to read as follows:

"All coverings or wrappers of prints, bricks, or rolls of renovated butter, whether paper or cloth, must have the words 'Renovated Butter' in one or two lines, marked, branded, stenciled, or printed thereon in black or nearly black upon white or light ground, in full-faced gothic letters not less than three-eighths of an inch square, so placed as to be the only marking upon one side or surface of the parcel so packed."

The Government authorities recognize the fact that renovated butter is not butter and should not be sold as butter. The above regulation makes it necessary for each package of renovated butter offered for sale in interstate commerce to be labeled so as to plainly show that it is renovated butter. The sale of renovated butter as butter is a violation of the State Food Law, and if detected will have to be prosecuted.

#### BUTTER AND BUTTER SUBSTITUTES.

Laboratory Number.	Foam Test.	Water— Per Cent.	Reading Refractometer, 40° C.	Refractive Index.	Remarks and Conclusions.
12953	Negative.....	12.00	43.0	1.4545	Butter.
12783	-----	7.98	44.0	1.4552	Butter.
12948	Negative.....	14.10	43.0	1.4545	do.
13215	-----	14.21	46.0	1.4566	do.
12784	-----	14.29	44.0	1.4552	do.
13245	Waterhouse Test, Positive.	-----	44.2	1.4553	do.
13220	-----	9.25	45.0	1.4559	Renovated butter, sold as butter; misrepresented; sale illegal.
13217	-----	19.31	45.0	1.4559	Butter, containing too much moisture; sale illegal.
13222	-----	13.08	45.0	1.4559	Renovated butter, sold as tub butter; misrepresented; sale illegal.
13214	-----	12.06	46.0	1.4566	Butter.
12958	Foam Test, Positive.	9.30	44.0	1.4552	Process butter.
12957	do.....	9.60	44.0	1.4552	Process butter, sold by dealer as butter; misrepresented; sale illegal.
12782	-----	7.09	43.5	1.4548	Butter.
12944	Negative.....	9.80	43.0	1.4545	do.
12954	do.....	12.70	43.0	1.4545	do.

## RESULTS OF THE EXAMINATION OF

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13221	-----	Butter, Country.	A. B. Jenkins, Pine Top, N. C.	Cummings Grocery Co., Tarboro.
13224	Strawberry Creamery Butter.	Butter	Kingan & Co., Richmond, Va.	Curtis-Pierson, Enfield.
13218	Process Butter	do	do	J. B. Buckingham, Fayetteville.
13053	-----	do	-----	J. T. Lee, Benson, R. 2.
13729	Butter	-----	-----	Mathias Owens, Elizabeth City.
13734	-----	Butter	-----	do
13219	-----	do	-----	Sanford Supply Co., Sanford.
13223	Carnation Process Butter.	Butter, Tub	Scott & Co., Norfolk, Va.	D. Lichtenstein, Tarboro.
13225	do	Butter, Good Tub	do	C. G. Evans, Weldon.
12956	"Carnation," Perfect in Quality, Guaranteed Absolutely Pure Process Butter.	Butter, Process	do	Thiem & Birdsong, Raleigh.
12959	-----	Butter, Country	-----	M. Waller, Monroe.
13226	-----	Butter	Charlie Williams, Winston-Salem, N. C.	Putnam Grocery Co., Winston-Salem.
13216	-----	Butter, Country	Mrs. John Wilson, Wilson Mills, N. C.	City Grocery Co., Smithfield.
12952	Young's Elgin Creamery.	Butter	W. I. Young, New York, N. Y.	Baggett Bros., Wilmington.

## CHEESE.

Cheese is the sound, solid, and ripened product made from milk and cream by coagulating the casein thereof with rennet or lactic acid, with or without the addition of ripening ferments and seasoning, and contains, in the water-free substance, not less than 50 per cent of milk fat.

Skim-milk cheese or part skim-milk cheese is the sound, solid, and ripened product made from skim-milk or part skim-milk.

A product of this kind containing less than 50 per cent of milk fat in the water-free substance must be sold as skim-milk cheese or as part skim-milk cheese, as the case may be, or under some name that will indicate to the purchaser that it is not a standard cheese.

On account of the way cheese is sold at retail, it is an easy matter for

BUTTER AND BUTTER SUBSTITUTES—*Continued.*

Laboratory Number.	Foam Test.	Water— Per Cent.	Reading Refractometer, 40° C.	Refractive Index.	Remarks and Conclusions.
13221	-----	4.32	45.5	1.4562	Butter, sold short weight; sale was illegal.
13224	-----	8.20	45.0	1.4559	Butter.
13218	-----	9.52	45.0	1.4559	Renovated butter, sold by dealer as butter; misrepresented; sale illegal.
13053	-----		47.0	1.4573	Compound butter, containing fat other than milk fat.
13729	-----		44.5	1.4555	Butter.
13734	Good-----		44.2	1.4453	do.
13219	-----	13.21	45.0	1.4559	do.
13223	-----	12.13	44.5	1.4555	Renovated butter, sold as butter; misrepresented; sale illegal.
13225	-----	14.26	44.5	1.4555	do.
12956	Positive-----	12.40	44.0	1.4552	Process butter.
12959	Negative-----	12.90	43.0	1.4545	Butter.
13226	-----	5.29	44.5	1.4555	do.
13216	-----	15.26	44.5	1.4555	do.
12952	Negative-----	8.70	43.0	1.4545	do.

a dealer to buy skim-milk cheese and sell same to his customers as cheese, and it seems to be quite the practice to do so—at least, they often sell skim-milk cheese as cheese.

A product made as above described, that contains less than 50 per cent milk fat in the water-free substance, cannot be legally sold as cheese, but must be sold as skim-milk cheese or part skim-milk cheese, as the case may be.

The Food Law provides that if a food product is below standard, it is deemed to be adulterated and its sale illegal.

Dealers are cautioned that the sale of skim-milk cheese as cheese is illegal, and will have to be prosecuted under the Food Law.

The results of the examination of 38 samples, made during the year, will be found in the table below, with conclusions drawn from same.

## RESULTS OF THE EXAMINATION OF

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
12781	-----	Cheese -----	Albemarle Grocery Co., Edenton, N. C.	E. W. Burton, Edenton -----
13195	Antrim's Best -----	do -----	C. W. Antrim & Sons, Richmond, Va.	S. C. Turnage, Smithfield ----
13196	do -----	do -----	do -----	City Grocery Co., Smithfield.
13200	do -----	do -----	do -----	C. V. Williams & Co., Hamlet
13201	do -----	do -----	do -----	Lee Store Co., Sanford -----
12787	do -----	do -----	do -----	D. T. Worley & Co., Selma.---
12774	-----	Cheese, Full Cream.	Armour & Co., Richmond, Va.---	W. M. Smith, Goldsboro.---
13208	-----	do -----	Armour & Co., Lynchburg, Va.---	Reidsville Brokerage Co., Reidsville.
12946	-----	Cheese -----	Armour & Co. -----	A. H. Caldwell, Charlotte.---
12945	-----	do -----	Armour & Co., Richmond, Va.---	Lopp Bros., Lexington.---
12785	-----	Cheese, Full Cream.	-----	R. C. Cannon & Son, Ayden.---
12778	"Special" Skimmed Milk.	do -----	-----	E. A. Cherry, Morehead City.---
13204	-----	Cheese, Cream.	Corkran & Hill Co., Baltimore, Md.	M. C. Forbes, Wilson.-----
12777	Tarbell -----	Cheese, Full Cream.	do -----	Kinston Peanut Co., Kinston.---
13213	Imperial Full Cream Cheese.	Cheese, Cream.	Davis Bros. Cheese Co., Plymouth, Wis.	Meador Supply Co., Madison.---
13209	Clover Brand, Full Cream Cheese.	Cheese -----	Friedmann Mfg. Co., Norfolk, Va.	J. H. & W. F. Low, Greensboro.
12773	-----	Cheese, Full Cream.	Goldsboro Grocery Co., Goldsboro, N. C.	Mrs. L. B. Bass, Goldsboro.---
13205	Davis' Famous Full Cream Cheese.	Cheese -----	George J. Hales Co., Rocky Mount, N. C.	J. R. Cutrell, Rocky Mount.---
13210	-----	do -----	Hancock Grocery Co., Winston-Salem, N. C.	J. H. Weisner, Winston-Salem
12960	Banquet Brand.---	do -----	Heath-Morrow Co., Monroe, N. C.	Helms & Huntley, Monroe.---
12779	Golden Rod, Full Cream Cheese.	do -----	F. H. Hobbs & Co., Norfolk, Va.---	C. V. Hill, Beaufort.-----
13202	-----	do -----	Howard Grocery Co., Sanford, N. C.	W. T. Buchanan, Sanford.---
12951	Ridgefield -----	Cheese, Full Cream.	Independent Ice Co., Wilmington, N. C.	Steljes & Co., Wilmington.---
12943	-----	do -----	Jones & Kornegay, Mount Olive, N. C.	J. W. Alphin, Mount Olive.---
13203	-----	Cheese, Cream.	Kingan & Co., Richmond, Va.---	Carroll Grocery Co., Wilson.---
12947	-----	Cheese -----	do -----	Aman Grocery Co., Clinton.---
12949	-----	do -----	E. A. Saunders Sons Co., Richmond, Va.	Finch Bros., Lexington.-----
12776	-----	Cheese, Full Cream.	S. C. Sitterson, Kinston, N. C.---	Stroud Bros., Kinston.-----
12780	-----	Cheese -----	Southern Distributing Co., Norfolk, Va.	W. H. Bowen, Belhaven.-----
12786	May Flower, Fancy Full Cream Cheese.	do -----	S. J. Stevens & Co., Cincinnati, Ohio.	R. A. Shaheen, Ayden.-----

## CHEESE AND CHEESE SUBSTITUTES.

Laboratory Number.	Milk Fat, Water-Free Basis—Per Cent.	Reading Refractometer on Fat, 40° C.	Refractive Index.	Water—Per Cent.	Remarks and Conclusions.
12781	56.00	47.0	1.4573	30.90	Cheese.
13195	47.00	46.0	1.4566	32.19	Cheese, below standard in milk fat; adulterated; sale illegal.
13196	40.00	46.0	1.4566	29.91	do.
13200	52.99	46.4	1.4569	32.72	Cheese.
13201	55.85	46.5	1.4569	31.46	do.
12787	51.12	46.5	1.4569	33.51	do.
12774	54.94	46.5	1.4569	31.61	do.
13208	50.07	46.0	1.4566	32.66	do.
12946	57.20	46.0	1.4565	30.90	do.
12945	60.00	46.0	1.4565	32.80	do.
12785	52.79	46.5	1.4569	33.53	do.
12778	22.79	46.5	1.4569	43.07	Skim-milk cheese, sold by dealer as full cream cheese; misrepresented; sale illegal.
13204	54.12	47.0	1.4573	33.62	Cheese.
12777	43.29	47.0	1.4573	32.74	Cheese, below standard in milk fat; adulterated; sale illegal.
13213	50.64	46.0	1.4566	28.49	Cheese.
13209	42.40	46.0	1.4566	29.88	Cheese, from part skim-milk; below standard; misbranded; sale illegal.
12773	56.62	46.5	1.4569	34.70	Cheese.
13205	44.69	46.5	1.4569	33.32	Cheese, below standard in milk fat; misbranded; sold as cheese; sale illegal.
13210	50.31	46.5	1.4569	32.89	Cheese.
12960	46.30	46.0	1.4565	32.30	Cheese, below standard in milk fat; adulterated; sale illegal.
12779	42.18	47.0	1.4573	33.37	do.
13202	52.00	46.0	1.4566	32.80	Cheese.
12951	55.00	46.0	1.4565	33.90	do.
12943	55.70	46.0	1.4565	34.70	do.
13203	50.02	47.0	1.4573	35.86	do.
12947	58.30	46.0	1.4565	37.60	do.
12949	58.60	46.0	1.4565	33.40	do.
12776	48.31	47.2	1.4574	35.64	Cheese, below standard in milk fat; sale illegal.
12780	52.70	46.5	1.4569	31.20	Cheese.
12786	48.05	46.5	1.4569	33.68	Cheese, from part skim-milk; below standard; misbranded; sale illegal.

## RESULTS OF THE EXAMINATION OF

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13212	Cheese, Tarbell....	Cheese.....	Swift & Co., Winston-Salem.....	Putnam Grocery Co., Winston-Salem.
13207	.....	Cheese, Full Cream.	Swift & Co., Richmond, Va.....	Eugene Johnston, Littleton....
13206	.....	Cheese.....	Swift & Co., Rocky Mount, N. C.	Kelly Bryant & Bro., Rocky Mount.
13197	.....	do.....	Swift & Co., Fayetteville, N. C.	J. L. Tatum, Fayetteville.....
13198	.....	do.....	do.....	J. J. Thrower & Co., Red Springs.
13199	.....	do.....	do.....	W. G. Dean, Red Springs.....
13211	.....	do.....	Winston Grain Co., Winston-Salem, N. C.	Woodleigh Grocery Co., Winston-Salem.
12950	Fancy Full Cream Cheese.	do.....	W. I. Young & Co., New York, N. Y.	Holmes Grocery Co., Wilmington.

## CIDER AND IMITATION CIDERS.

Cider is a product made by the normal alcoholic fermentation of apple juice, and the usual cellar treatment, and contains not more than 7 per cent of alcohol by volume, not less than 2 per cent and not more than 12 per cent of solids, not more than 8 per cent of reducing sugars, and not less than 0.2 per cent nor more than 0.4 per cent of cider ash.

Cider, to comply with the North Carolina Food Law, must be made entirely of unadulterated apple juice. A product made from the juice of any other fruit than apples, if offered for sale, must bear the name of the fruit from which it is made. If artificial color or flavor is added, the fact must be stated on the label, and the product must be sold as a compound or an imitation cider; otherwise it will be classed as adulterated or misbranded, and the sale prohibited.

## RESULTS OF THE EXAMINATION OF

Laboratory Number.	Name of Material. Sample Sent for Analysis.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13238	Cider.....	.....	Dr. N. H. Andrews, Pembroke....
13237	do.....	.....	do.....
13239	do.....	.....	do.....
13247	Cider Compound.....	.....	C. G. Armfield, Elkin.....
14149	Cider, Imitation.....	.....	M. V. Barnhill, Rocky Mount....
13058	Beverage.....	.....	A. B. Boykin.....
13062	Cider.....	.....	B. F. Bray, Hertford.....
12534	do.....	.....	F. P. Bullard, Roseboro.....
13580	Re-Vi-Co.....	Richmond Vinegar Co., Richmond, Va.	W. L. Burroughs, Dabney.....

CHEESE AND CHEESE SUBSTITUTES—*Continued.*

Laboratory Number.	Milk Fat, Water-Free Basis—Per Cent.	Reading Refractometer on Fat, 40° C.	Refractive Index.	Water—Per Cent.	Remarks and Conclusions.
13212	50.02	46.0	1.4566	34.75	Cheese.
13207	50.61	46.5	1.4569	30.27	do.
13206	52.13	46.5	1.4569	27.59	do.
13197	50.23	46.0	1.4566	30.97	do.
13198	46.40	46.0	1.4566	27.39	Cheese, below standard in milk fat; adulterated; sale illegal.
13199	50.40	46.0	1.4566	27.55	Cheese.
13211	48.00	46.0	1.4566	34.12	Cheese, slightly below standard in milk fat; sale illegal.
12950	49.40	46.0	1.4565	32.00	do.

The sale of compound and imitation cider is legal, provided it contains nothing deleterious to health and is sold under its own name, compound cider, or imitation cider; but the sale of a compound cider or imitation cider as cider is a violation of the law.

The 26 samples reported below were sent to the Department by city and county officials whose duty it is to enforce the prohibition law. The Department has no authority of law or funds for work under the prohibition law, but as the State makes no provision for the determination of alcohol in beverages, and as it is necessary to know the amount of alcohol present in many cases to enforce the law, the Department of Agriculture does this work when it can be done without interfering with the duties of the Department.

## CIDERS AND IMITATION CIDERS.

Laboratory Number.	Alcohol, Per Cent (by Volume).	Remarks and Conclusions.
13238	7.95	Cider; imitation; sale illegal.
13237	6.82	do.
13239	7.70	Compound cider; sale illegal.
13247	6.35	Compound cider; intoxicating; sale illegal.
14149	4.85	Compound cider; artificially flavored; sale illegal.
13058	10.39	Compound cider; sale illegal.
13062	8.22	do.
12534	3.66	Compound cider.
13580	7.15	Compound cider; sale illegal.

## RESULTS OF THE EXAMINATION OF

Laboratory Number.	Name of Material. Sample Sent for Analysis.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
12661	Cider.....	Frisco Cider Co., St. Louis, Mo.....	J. M. Davis, Statesville.....
12798	Cider, Compound.....		L. M. Glazener, Rosman.....
12911	Cider, Imitation.....		C. E. Harrell, Aulander.....
13949	Cider.....		J. M. Mabry, Concord.....
13737	Cider, Apple.....		M. W. Nash, Hamlet.....
13434	Cider.....		Mrs. J. W. Rallings, Indian Trail.....
13575	do.....		R. H. Salsbury, Hassell.....
13574	do.....		do.....
13244	do.....		J. F. Spruill, Lexington.....
13242	do.....		do.....
13243	do.....		do.....
13241	do.....		do.....
12939	do.....		C. F. Sumner, Hertford.....
13579	do.....	E. I. Whitehead & Co., Louisville, Ky.	Bailey Lumber Co., Penland.....
12691	do.....	do.....	J. M. Deaton, Statesville.....
13499	do.....		J. A. Wiggs, Wilson.....
13054	Cider, Imitation.....		T. C. Williford, Aulander.....

## CINNAMON EXTRACT.

## DEFINITIONS AND STANDARDS.

Cinnamon extract is the flavoring extract prepared from oil of cinnamon, and contains not less than 2 per cent by volume of oil of cinnamon.

Oil of cinnamon is the lead-free volatile oil obtained from the bark of the Ceylon cinnamon tree, and contains not less than 65 per cent by weight of cinnamic aldehyde and not more than 10 per cent by weight of eugenol.

## RESULTS OF THE EXAMINATION

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13547	Cinnamon Extract, McNeal's Standard.	Kent Drug Co., Baltimore, Md....	W. A. Whitaker, Apex.....
13548	Cinnamon Extract, Best by Test.	Sampson Drug Co., Winston- Salem, N. C.	J. S. Needham, Pilot Mountain.....
10900		Surry Drug Co., Elkin, N. C.....	Elkin Grocery Co., Elkin.....
13549	Cinnamon Extract.....	Winston Drug Co., Winston- Salem, N. C.	A. N. Swanson, Pilot Mountain.....
13546	Cinnamon, Our Seal Brand....	Vaughn-Crutchfield Co., Win- ston-Salem, N. C.	Finch Bros., Lexington.....

CIDERS AND IMITATION CIDERS—*Continued.*

Laboratory Number.	Alcohol, Per Cent (by Volume).	Remarks and Conclusions.
12661	5.00	Imitation cider; sale illegal.
12798	5.37	Compound cider; intoxicating; sale illegal.
12911	0.20	Imitation cider.
13949	0.20	Compound cider.
13737	5.86	Cider; intoxicating; sale illegal.
13434	2.57	Compound cider; sale illegal.
13575	6.90	Compound cider; intoxicating; sale illegal.
13574	6.87	do.
13244	0.30	Imitation cider.
13242	6.97	Compound cider; sale illegal.
13243	3.92	do.
13241	5.20	do.
12939	9.95	do.
13579	7.48	do.
12691	5.00	Compound cider; intoxicating; sale illegal.
13499	6.45	Cider; intoxicating; sale illegal.
13054	-----	Imitation cider.

Only five samples of cinnamon extract were examined, one of which is below standard, containing only 0.60 per cent of cinnamon oil, when it should contain not less than 2 per cent of oil, and is, therefore, adulterated. One of the five samples was branded Cassia Cinnamon, when it was an extract. Cinnamon is the bark of the cinnamon tree, and not an extract. The sale of the sample as cinnamon extract would be legal, but its sale as cinnamon is illegal.

## OF CINNAMON EXTRACTS.

Laboratory Number.	Cinnamon Oil (by Precipitation), Per Cent.	Alcohol, Per Cent.	Remarks and Conclusions.
13547	2.00	67.20	Cinnamon extract.
13548	0.60	-----	Cinnamon extract, below standard; adulterated; misbranded; sale illegal.
10900	2.00	-----	Cinnamon extract.
13549	2.00	39.12	Cinnamon extract, claims 50 per cent alcohol; contains 39.12 per cent.
13546	2.40	45.40	Cinnamon extract; is branded cassia cinnamon; misbranded. It is an extract and not cinnamon; sale as cinnamon illegal.

## COFFEE AND COFFEE SUBSTITUTES.

## DEFINITIONS AND STANDARDS.

Coffee is the seed of a small tree, *coffea*, whose fleshy fruit is about the size of a small cherry, and contains two seeds joined on their flat sides, which when freed from the pulp and the enveloping membrane are the coffee beans of commerce.

Roasted coffee is coffee which by the action of heat has become brown and developed its characteristic aroma, and contains not less than 10 per cent of fat and 3 per cent of ash.

The principal action or stimulating constituent of coffee is caffeine, a white, bitter crystallizable substance.

The principal material which is used to mix with and adulterate coffee is chicory, though cereals and leguminous seeds, such as wheat, rye, barley, beans, and peas are often used. Many brands of so-called coffee on the market contain from 20 to 60 per cent of chicory. The manufacturers of these products generally claim that the chicory is added, not to adulterate, but to actually improve the quality and to give

## RESULTS OF THE EXAMINATION OF

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13254	Coffee and Chicory, Honey-moon.	American Coffee Co., New Orleans, La.	Peedin & Peterson, Smithfield..
14198	Dixieland Coffee	do	Frank Foster, Asheville.....
13280	Coffee, Morara Brand	C. W. Antrim & Sons, Richmond, Va.	Thomas Grocery Co., Wilmington.
12894	do	do	J. L. Starkey, Greenville.....
14188	Coffee and Chicory, Good Luck Brand.	Aragon Coffee Co., Richmond, Va.	Roberts Grocery Co., Shelby...
12896	Coffee and Chicory, Premium Brand.	do	J. Long, Greenville.....
13264	Coffee, Pure, Valri	do	J. M. Ellington, Oxford.....
13260	Coffee and Chicory, "Norso-lina."	Austin-Nichols Co., New York, N. Y.	J. H. Newsom, Littleton.....
13278	Coffee, Ground, Tokoco	Bowers Bros., Richmond, Va.	W. D. Thomas & Co., Warsaw...
13268	do	do	O. F. Brown, Winston-Salem...
13267	Coffee, Tokoco	do	A. W. Norwood, Graham.....
13261	Coffee, Old Brazil Brand	Brazil Syndicate R. & B. Co., New York, N. Y.	Eugene Johnston, Littleton...
13274	do	do	Smith Grocery Co., Lexington..
13279	Coffee, Pure, Autoerat	Brownell & Field Co., Providence, R. I.	W. H. Turley, Wilmington.....
14192	Coffee and Chicory, Carhart's Country Blend.	Carhart & Bros., New York, N. Y.	W. P. Surles, Dunn.....
14191	Coffee, Cook's Choice Brand	Cook & Harris, Concord, N. C.	Cook & Harris, Concord.....
13255	Coffee and Chicory, Dannemiller's 10c.	Dannemiller Coffee Co., Brooklyn, N. Y.	W. H. Adams, Dunn.....
12891	Coffee, Choice Rio, No. 1	J. T. Davenport, Morehead City, N. C.	J. B. Sawyer, Morehead City...

strength to the coffee. This claim is misleading to the public. Roasted chicory contains a large amount of caramel and starchy matter, that impart to the product, when made into a liquid for use as a beverage, a black, thick, soup-like appearance. The effect produced in coffee by chicory can no more correctly be regarded as adding strength to the coffee than if so much roasted starch and caramel had been added to it. *Chicory is not added to coffee to give it strength, but to cheapen the product.*

The addition of chicory or any other substance to coffee, without stating the fact on the label, is a violation of the law. Chicory and cereals cost less than one-fifth the price of coffee. Then, why pay the price of coffee for chicory and cereals when the latter are mixed with coffee?

Fifty-eight samples of these products were examined, and all were properly branded except three. They were branded Coffee and Chicory, when the chicory, being in excess, should come first in the name, and read Chicory and Coffee.

The results of the examination are published in the table below.

#### COFFEE AND COFFEE SUBSTITUTES.

Laboratory Number.	Specific Gravity.	Coffee—Per Cent.	Chicory—Per Cent.	Remarks and Conclusions.
13254	1.01965	48.00	52.00	Chicory and coffee, chicory being in excess, it should come first on label.
14198	1.00954	100.00	00.00	Coffee.
13280	1.01039	100.00	00.00	Coffee.
12894	1.01019	100.00	00.00	do.
14188	1.01824	57.00	43.00	Coffee and chicory.
12896	1.02531	16.00	84.00	Chicory and coffee, chicory being much in excess, should be first on label; misbranded; sale illegal.
13264	1.00970	100.00	00.00	Coffee.
13260	1.01792	57.00	43.00	Coffee and chicory.
13278	1.00907	100.00	00.00	Coffee.
13268	1.00953	100.00	00.00	do.
13267	1.00970	100.00	00.00	do.
13261	1.01005	100.00	00.00	do.
13274	1.01020	100.00	00.00	do.
13279	1.01047	100.00	00.00	do.
14192	1.01249	89.00	11.00	Coffee and chicory.
14191	1.01038	100.00	00.00	Coffee.
13255	1.02098	40.00	60.00	Chicory and coffee; misbranded; should be branded chicory and coffee; sale illegal.
12891	1.00997	100.00	00.00	Coffee.

## RESULTS OF THE EXAMINATION OF COF

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
12892	Coffee, Choice Rio, No. 1.....	J. T. Davenport, Morehead City, N. C.	S. T. Harrell & Son, Morehead City.
14190	Coffee, Middlesex Brand.....	Dwinell-Wright Co., Boston and Chicago.	Lipard & Barrier, Concord.....
14189	Coffee, Tip Top.....	.....do.....	H. L. Parks & Co., Concord.....
14182	Coffee, No. 2, Excellent.....	.....do.....	Bradford Grocery and Produce Co., Statesville.
13272	Coffee, Good, Caraja Brand.....	.....do.....	W. H. Moffitt, Lexington.....
14197	Coffee, Guaranteed Pure, Grandma's Cup.	A. Englehard & Sons Co., Louisville, Ky.	H. M. Flynn, Hendersonville...
14186	Coffee, Queen Quality.....	B. Fischer & Co., New York, N. Y.	E. B. Hackburn, New Bern.....
13263	Coffee, Pure, Ellington's Special.	James G. Gill, Norfolk, Va.....	Ellington Grocery Co., Henderson.
13252	Coffee and Chicory, Auto Superior.	.....do.....	W. J. Barbour & Sons, Clayton.
12895	Coffee, Full Dress.....	.....do.....	J. L. Starkey, Greenville.....
14181	Coffee, Sovereign Brand.....	Edwin J. Gillies & Co., New York, N. Y.	G. H. Shaver, Salisbury.....
13250	Premium Brand.....	Globe Coffee and Molasses Co., New Orleans, La.	Clayton Department Store, Clayton.
13256	Coffee, Perfection, Java.....	Martin L. Hall & Co., Boston, Mass.	A. S. Melvin, Fayetteville.....
12897	Coffee, Special Brand.....	.....do.....	R. A. Shaheen, Ayden.....
13259	Coffee and Chicory, Pride of Carthage.	B. Hurwitz & Bro., Carthage, N. C.	B. Hurwitz & Bro., Carthage...
14187	Coffee, Virginia Dare.....	Imperial Coffee Co., Richmond, Va.	B. T. Barker & Co., Gastonia...
13257	Coffee and Chicory Compound, Sampson Brand.	Levering Coffee Co., Baltimore, Md.	Nisbet & Womble, Sanford.....
13258	Coffee, Honey Drip Brand.....	.....do.....	.....do.....
13262	Coffee, Handicap.....	.....do.....	Ballard-Cheatham Co., Franklinton.
13265	Coffee and Chicory, Compound, Largo.	.....do.....	Pettigrew & King Grocery Co., Burlington.
12893	.....do.....	.....do.....	V. D. Jones, Edenton.....
13276	Rhyne Bros., Charlotte, N. C.	Merchants Coffee Co., Baltimore, Md.	Rhyne Bros., Charlotte.....
14196	Coffee and Chicory, Gold Seal.	Mustin-Robertson Co., Asheville, N. C.	E. S. Harrold, Waynesville.....
13270	Coffee and Chicory, Pointer..	New Orleans Coffee Co., New Orleans, La.	W. W. Thomas, Mount Airy....
13275	Coffee, Roasted, Van Every's Best Blend.	The North State Coffee Co., Charlotte, N. C.	C. M. Fite, Charlotte.....
14194	Coffee and Chicory, Suwanee River.	Potter-Sloan-O'Donohue Co., New York, N. Y.	John R. Smith, Walnut Cove...
13251	Coffee and Chicory, Elephant Compound.	.....do.....	W. J. Barbour & Sons, Clayton.
13266	Coffee and Chicory, Our Dime.	E. A. Saunders & Sons Co., Richmond, Va.	Cobles Grocery Co., Burlington
13281	Coffee, White Rose.....	Seeman Bros., New York, N. Y.	J. T. Pinkston & Son, Wadesboro.
14183	Coffee, Carolina Special.....	Slayden-Fakes & Co., Asheville, N. C.	W. F. McPeeters & Co., Marion.
13273	Coffee, Smith's Favorite.....	Smith Grocery Co., Lexington, N. C.	Smith Grocery Co., Lexington..
14195	Coffee and Chicory, Gold Medal.	Southern Coffee Mills, New Orleans, La.	J. H. Weisner & Co., Winston-Salem

FEE AND COFFEE SUBSTITUTES—*Continued.*

Laboratory Number.	Specific Gravity.	Coffee— Per Cent.	Chicory— Per Cent.	Remarks and Conclusions.
12892	1.01005	100.00	00.00	Coffee.
14190	1.01042	100.00	00.00	do.
14189	1.01014	100.00	00.00	do.
14182	1.01038	100.00	00.00	do.
13272	1.01043	100.00	00.00	do.
14197	1.00988	100.00	00.00	do.
14186	1.01050	100.00	00.00	do.
13263	1.01021	100.00	00.00	do.
13252	1.01288	84.00	16.00	Coffee and chicory.
12895	1.01033	100.00	00.00	Coffee.
14181	1.01005	100.00	00.00	do.
13250	1.01492	73.00	27.00	Coffee and chicory.
13256	1.01041	100.00	00.00	Coffee.
12897	1.01008	100.00	00.00	do.
13259	1.01534	72.00	28.00	Coffee and chicory.
14187	1.01002	100.00	00.00	Coffee.
13257	1.01710	61.00	39.00	Coffee and chicory.
13258	1.01003	100.00	00.00	Coffee.
13262	1.01008	100.00	00.00	do.
13265	1.01828	55.00	45.00	Coffee and chicory.
12893	1.01554	69.00	31.00	do.
13276	1.01035	100.00	00.00	Coffee.
14196	1.01452	78.00	22.00	Coffee and chicory.
13270	1.01832	55.00	45.00	do.
13275	1.01009	100.00	00.00	Coffee.
14194	1.01771	60.00	40.00	Coffee and chicory.
13251	1.01722	60.00	40.00	do.
13266	1.01650	65.00	35.00	do.
13281	1.01067	100.00	00.00	Coffee.
14183	1.01024	100.00	00.00	do.
13273	1.00960	100.00	00.00	do.
14195	1.01744	62.00	38.00	Coffee and chicory.

## RESULTS OF THE EXAMINATION OF COF

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
14185	Coffee, C. D. M. Brand .....	Southern Coffee Mills, New Orleans, La.	E. A. Walters, LaGrange .....
13277	Coffee, Pure, "Good Koffy" .....	do .....	L. C. McCullen, Mount Olive .....
13271	Coffee, Vacuum Treated .....	Sprague, Warner & Co., Chicago, Ill.	W. H. Moffitt, Lexington .....
13269	Coffee and Chicory, R. T. ....	The Reily-Taylor Co., New Orleans, La.	Kirby & Tilley, Winston-Salem .....
13253	Coffee and Chicory, Daily Delight. ....	do .....	J. G. Barbour & Sons, Clayton .....
14184	Coffee and Chicory, Mogul Brand. ....	F. W. Wagner & Co., Charleston, S. C.	W. A. Davis, Asheville .....
13282	Coffee, Roasted, Brownie .....	R. C. Williams & Co., New York, N. Y.	C. N. Bruner, Wadesboro .....
14193	Coffee and Chicory, Glen Raven. ....	Woodson Spice Co., Toledo, Ohio ..	Spray Mercantile Co., Spray .....

## CURRANTS, FIGS, DATES, AND RAISINS, DRIED.

## DEFINITIONS.

Fruits are the clean, sound, edible, flesh fructifications of plants, distinguished by their sweet, acid, and ethereal flavor.

Dried fruit is the clean, sound product made by drying mature, properly prepared, fresh fruit in such a way as to take up no harmful substance, and conforms in name to the fruit used in its preparation.

Thirty samples of dried figs, currants, dates, and raisins were examined. The examination was physical, and the object was to see if they were in good condition, free from worms, bugs, etc., and fit for human food.

Some of the samples were taken in the winter and others during the

## RESULTS OF THE EXAMINATION OF

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
14089	Currants, Ensign .....	C. W. Antrim & Sons, Richmond, Va.	W. D. Hightower, Reidsville .....
14099	Currants, Gold Medal Brand. ....	do .....	R. C. Poore, Mount Airy .....
14100	Currants, Cleaned, Ensign Brand. ....	do .....	Galloway & Jackson, Mount Airy. ....
14293	Dates, Golden Sunbeam .....	Austin-Nichols Co., New York, N. Y.	J. R. Ferrall & Co., Raleigh .....
14289	Dates, Pitted, Sunbeam .....	do .....	S. R. Lentz, Charlotte .....
14288	Figs, Dried, Sunbeam .....	do .....	do .....
14284	Figs .....	do .....	S. H. Youngblood, Charlotte .....

FEE AND COFFEE SUBSTITUTES—*Continued.*

Laboratory Number.	Specific Gravity.	Coffee—Per Cent.	Chicory—Per Cent.	Remarks and Conclusions.
14185	1.01010	100.00	00.00	Coffee.
13277	1.00973	100.00	00.00	do.
13271	1.00981	100.00	00.00	do.
13269	1.01532	72.00	28.00	Coffee and chicory.
13253	1.01724	60.00	40.00	do.
14184	1.01946	50.00	50.00	do.
13282	1.01015	100.00	00.00	Coffee.
14193	1.01438	79.00	21.00	Coffee and chicory.

summer months. The samples taken during the winter were found to be in good condition, but sixteen of those taken after the weather was warm contained worms, bugs, etc., and were unfit for food.

The law says that a product shall be deemed to be adulterated if it consists in whole or in part of a filthy, decomposed, or putrid animal or vegetable substance, or is otherwise unfit for food.

That such fruit containing worms, bugs, and excrement from same is unfit for food no one would deny. That being the case, dealers are cautioned about offering such fruit for sale during warm weather, when they are so likely to be in bad condition. If offered for sale after the weather is warm, such products should be looked into to see that they are all right.

## DRIED FIGS, CURRANTS, DATES, AND RAISINS.

Laboratory Number.	Remarks and Conclusions.
14089	Currants, dried; condition bad; unfit for food; contained bugs; sale illegal.
14099	do.
14100	Currants, dried.
14293	Dates, dried.
14289	Dates, pitted, dried.
14288	Figs, dried.
14284	do.

## RESULTS OF THE EXAMINATION OF DRIED FIGS.

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
14286	Dates, Golden Dried.....	Austin-Nichols Co., New York, N. Y.	L. L. Surratt, Charlotte .....
14086	Raisins, Seeded, Consort.....	J. K. Armsby Co., Fresno, Cal.....	S. F. Watkins, Reidsville.....
14093	Currants, A. & P. Cleaned, Grandmother's Brand.	A. & P. Tea Co., Jersey City, N. J.	A. & P. Tea Co., Greensboro....
14291	Dried Figs.....		Boyd-Garner Co., Charlotte.....
14097	Raisins, Seeded, Souvenir Choice.	Castle Bros., Fresno, Cal .....	J. J. Adams & Sons Co., Winston-Salem.
14098	Currants, Washed, Vigilant Brand.	Cromer Bros. & Co., Winston-Salem, N. C.	White Star Co., Winston-Salem.
14090	Dates, Jack Horner.....	U. H. Dudley & Co., Philadelphia, Pa.	W. D. Hightower, Reidsville....
14088	Currants, Crystal Brand.....	B. S. Janney, Jr., & Co., Philadelphia, Pa.	W. P. Ware, Reidsville.....
14287	Dates, Dried, Valca.....		J. F. Jamison & Co., Charlotte.....
14292	Raisins, Seeded.....		Johnson & McCullers, Raleigh....
14095	Dates, Ding Dong.....	Frank P. Kruger, New York, N. Y.	Moser Cash Store, Winston-Salem.
14092	Currants, Cleaned, Crown Brand.	.....do.....	M. J. Jeffries, Greensboro.....
14102	Dates, Golden, Taste Like More.	.....do.....	W. B. Church, Asheville.....
14091	Currants, Vigilant Brand.....		Leaksville Mercantile Co., Leaksville.
14096	Raisins, Seeded, Premier Brand.	Francis H. Leggett & Co., New York, N. Y.	Moser Cash Store, Winston-Salem.
14101	.....do.....	.....do.....	E. S. Harold, Waynesville.....
14290	Figs, Stuffed.....		S. R. Lentz, Charlotte.....
14087	Currants, Cleaned, Purity Brand.	Reidsville Grocery Co., Reidsville, N. C.	S. F. Watkins, Reidsville.....
14281	Raisins, Seeded.....		Smith Grocery Co., Lexington....
14094	Prunes, Finest Selected, Gold Medal Brand.	Vaughn & Co., Winston-Salem, N. C.	A. P. Grizzard, Winston-Salem....
14282	Dates, Dried.....		S. H. Youngblood, Charlotte....
14283	Raisins, Seeded.....		.....do.....
14285	Figs, Burbulia.....		.....do.....

## ICE-CREAM AND ICE-CREAM SUBSTITUTES.

## DEFINITIONS AND STANDARDS.

Ice-cream is a frozen product made from cream and sugar, with or without a natural flavoring, and contains not less than 10 per cent of milk fat.

Fruit ice-cream is a frozen product made from cream, sugar, and sound, clean, mature fruits, and contains not less than 8 per cent of milk fat.

Nut ice-cream is a frozen product made from cream, sugar, and sound nonrancid nuts, and contains not less than 8 per cent of milk fat.

CURRANTS, DATES, AND RAISINS—*Continued.*

Laboratory Number.	Remarks and Conclusions.
14286	Dates, dried.
14086	Raisins, dried; condition bad; contained bugs; unfit for food; sale illegal.
14093	Currants, dried; condition bad; contained bugs; unfit for food; sale illegal.
14291	Figs, dried.
14097	Raisins, dried; condition bad; contained bugs; unfit for food; sale illegal.
14098	Currants, dried; condition bad; contained bugs; unfit for food; sale illegal.
14090	Dates, dried; condition bad; contained bugs; unfit for food; sale illegal.
14088	Currants, dried; condition bad; contained bugs; unfit for food; sale illegal.
14287	Dates, dried.
14292	Raisins, seeded, dried.
14095	Dates, dried; condition bad; contained bugs; unfit for food; sale illegal.
14092	Currants, dried; condition bad; contained bugs; unfit for food; sale illegal.
14102	Dates, dried; condition not good; few bugs; unfit for food; sale illegal.
14091	Currants, dried; condition bad; contained bugs; unfit for food; sale illegal.
14096	Raisins, dried; condition bad; contained bugs; unfit for food; sale illegal.
14101	Dates, dried; condition not good; few bugs; unfit for food; sale illegal.
14290	Figs, stuffed.
14087	Currants, dried; condition bad; contained bugs; unfit for food; sale illegal.
14281	Raisins, dried.
14094	Prunes, dried; condition bad; contained bugs; unfit for food; sale illegal.
14282	Dates, dried.
14283	Raisins, seeded, dried.
14285	Figs, dried.

Many products, such as eggs, gelatine, etc., are used in the manufacture of so-called ice-cream, which is often very palatable, but which is not ice-cream, and if sold as such is a violation of the law.

Realizing that many dealers would desire to sell and many consumers desire to obtain cheaper products than a standard ice-cream, the Board of Agriculture made a regulation under which any product, not deleterious to health, can be legally sold in the State. The regulation merely provides that if the dealer will make known by placard or label the kind of product offered for sale by him, the Department will not contest the sale.

## REGULATION OF SALE OF ICE-CREAM SUBSTITUTES.

The sale of a product as ice-cream, containing gelatine, eggs, gum tragacanth or other vegetable gums, or the sale of a product as ice-cream which contains less than the required per cent of milk fat will not be contested: *Provided*, the same is labeled and sold as imitation ice-cream, compound ice-cream, gelatine ice-cream, egg ice-cream, milk ice-cream, or gum ice-cream (as the case may be); or if a placard bearing the following statement—

"Imitation ice-cream is served here."

"Compound ice-cream is served here."

"Egg ice-cream is served here."

"Gelatine ice-cream is served here."

"Milk ice-cream is served here," or

"Gum ice-cream is served here,"

(as the case may be) shall be posted in a conspicuous place in the room where any and all persons may see the same when purchasing cream;

## RESULTS OF THE EXAMINATION OF ICE-

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13601	-----	Ice-cream, Vanilla.	-----	Betts Ice-cream Co., Raleigh...
13625	-----	do	Arctic Ice and Coal Co., Greensboro, N. C.	Cates Pharmacy, Haw River...
13962	-----	Ice-cream, Peach.	do	Elkin Drug Co., Elkin.....
13654	-----	Ice-cream, Strawberry.	do	Five- and Ten-Cent Store, Greensboro.
13647	-----	Ice-cream, Peach.	do	Fordham's Drug Co., Greensboro.
13829	Purity Ice-cream.	do	do	Goldsboro Drug Co., Goldsboro.
13830	do	Ice-cream, Chocolate.	do	do
13627	-----	Ice-cream, Vanilla.	do	Graham Drug Co., Graham....
13651	-----	do	do	Greensboro Drug Co., Greensboro.
13648	-----	do	do	Greensboro Café, Greensboro...
13663	-----	Ice-cream, Compound.	do	Matton Drug Co., High Point..
13644	-----	Ice-cream, Chocolate.	do	McIlheney's Drug Co., Greensboro.
13667	Purity Ice-cream.	Ice-cream, Vanilla.	do	Ring Drug Co., High Point....
13652	do	do	do	Sykes Drug Store, Greensboro..
13653	do	Ice-cream, Strawberry.	do	do

and *Provided further*, that the statement on the placard is printed in plain black letters, not less than one inch in size, on a white background.

During the past year 165 samples of ice-cream and ice-cream substitutes have been examined, many of which were below standard and sold in violation of the law. Many that were below standard were not sold in violation of the law, as the dealers had placards in their places of business, as provided for by regulations, showing that the products offered for sale were not ice-cream, but were substitutes for same. If one wishes to buy an inferior product, he has a right to do so, and the Department has no objection to the sale, provided the dealer makes known to the purchaser what he is getting for his money. On the other hand, if the purchaser wishes a good product and pays the price of same, he has a right to expect and to get what he pays for.

Dealers are again cautioned that the sale of products as ice-cream that do not meet the requirements will be prosecuted unless the dealer complies with the regulation on sale of ice-cream.

#### CREAM AND ICE-CREAM SUBSTITUTES.

Laboratory Number.	Fat, Milk, Per Cent.	Solids, Per Cent.	Remarks and Conclusions.
13601	2.40	26.57	Ice-cream, compound; sign up; sale legal.
13625	5.50	29.40	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13962	5.12	33.10	Ice-cream, vanilla, below standard; adulterated; sale illegal.
13654	2.50	34.00	Ice-cream, strawberry, below standard; adulterated; no sign; sale illegal.
13647	5.80	29.90	Ice-cream, peach, below standard; adulterated; no sign; sale illegal.
13829	9.70	34.00	Ice-cream, peach.
13830	7.20	31.30	Ice-cream, chocolate, below standard; adulterated; sale illegal.
13627	8.50	34.90	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13651	6.90	30.20	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13648	7.90	32.00	do.
13663	7.90	32.30	Ice-cream, compound; sign up; sale legal.
13644	3.40	31.10	Ice-cream, chocolate, below standard; adulterated; no sign; sale illegal.
13667	6.90	22.30	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13652	8.60	24.50	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13653	8.10	27.60	Ice-cream, strawberry.

## RESULTS OF THE EXAMINATION OF ICE-

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13848	-----	Ice-cream, Vanilla.	Bradham's Broad Street Store, New Bern, N. C.	Bradham's Broad Street Store, New Bern.
13849	-----	Ice-cream, Chocolate.	do	do
13850	-----	Ice-cream, Peach.	do	do
13971	-----	Ice-cream, Vanilla.	Brame Drug Co., North Wilkesboro, N. C.	Brame Drug Co., North Wilkesboro.
13970	-----	Ice-cream, Chocolate.	do	do
13871	-----	Ice-cream.	Brannon-Hahn Ice-cream Co., Charlotte, N. C.	Biggs Drug Co., Rockingham.
13903	-----	Ice-cream, Strawberry.	do	Henry E. Kendall, Shelby
13889	-----	Ice-cream, Vanilla.	do	Reese-Stowe Co., Charlotte.
13888	-----	do	do	James P. Stowe & Co., Charlotte.
13880	-----	Ice-cream, Chocolate.	do	Brannon-Hahn Co., Charlotte.
13879	-----	Ice-cream, Vanilla.	do	do
13590	-----	Ice-cream, Vanilla.		J. C. Brantley, Raleigh.
13589	-----	Ice-cream, Walnut Caramel.		do
13588	-----	Ice-cream, Strawberry.		do
13699	-----	Ice-cream, Sherry.	Burke Drug Co., Morganton, N. C.	Burke Drug Co., Morganton.
13698	-----	Ice-cream, Vanilla.	do	do
13631	Compound Ice-cream.	do	Burlington Drug Co., Burlington, N. C.	Burlington Drug Co., Burlington.
13646	-----	do	George R. Campbell, Greensboro, N. C.	George R. Campbell, Greensboro.
13645	-----	Ice-cream, Strawberry.	do	do
13585	-----	Ice-cream, Vanilla.		California Fruit Store, Raleigh.
13586	-----	Ice-cream, Chocolate.		do
13587	-----	Ice-cream, Tutti-Frutti		do
13982	-----	Ice-cream, Strawberry.	E. H. Caudle, Rural Hall, N. C.	E. H. Caudle, Rural Hall.
13697	-----	Ice-cream, Vanilla.	City Bakery, Hickory, N. C.	City Bakery, Hickory.
13696	-----	Ice-cream, Pineapple.	do	do
13901	-----	Ice-cream, Strawberry.	Cleveland Drug Co., Shelby, N. C.	Cleveland Drug Co., Shelby.

CREAMS AND ICE-CREAM SUBSTITUTES—*Continued.*

Laboratory Number.	Fat, Milk, Per Cent.	Solids, Per Cent.	Remarks and Conclusions.
13848	12.50	33.50	Ice-cream, vanilla.
13849	10.90	35.10	Ice-cream, chocolate.
13850	10.60	32.60	Ice-cream, peach.
13971	7.58	25.20	Ice-cream, below standard; adulterated; no sign; sale illegal.
13970	7.90	29.10	do.
13871	6.00	29.50	Ice-cream, below standard; adulterated; no sign; sale illegal.
13903	10.20	36.00	Ice-cream, strawberry.
13889	8.70	31.90	Ice-cream, below standard; adulterated; no sign; sale illegal.
13888	9.40	36.40	Ice-cream, slightly below standard; no sign; sale illegal.
13880	8.60	37.40	Ice-cream, compound; sign up; sale legal.
13879	8.50	31.80	do.
13590	15.70	37.88	Ice-cream, vanilla.
13589	13.00	37.71	Ice-cream, nut.
13588	14.10	36.39	Ice-cream, strawberry.
13699	5.00	23.60	Ice-cream, sherry, below standard; adulterated; no sign; sale illegal.
13698	7.20	25.70	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13631	5.00	28.90	Ice-cream, compound.
13646	2.70	20.60	Ice-cream, vanilla, below standard; sign does not meet requirements of law; sale was illegal.
13645	4.30	23.60	Ice-cream, strawberry, below standard; sign does not meet requirements; sale was illegal.
13585	19.90	35.61	Ice-cream, vanilla.
13586	19.10	37.56	Ice-cream, chocolate.
13587	18.80	37.62	Ice-cream, tutti-frutti.
13982	2.37	26.20	Ice-cream, below standard; adulterated; no sign; sale illegal.
13697	7.30	30.00	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13696	6.48	28.60	Ice-cream, pineapple, below standard; adulterated; no sign; sale illegal.
13901	7.60	31.00	Ice-cream, strawberry, below standard; adulterated; no sign; sale illegal.

## RESULTS OF THE EXAMINATION OF ICE-

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13902	Ice-cream, Vanilla.		Cleveland Drug Co., Shelby, N. C.	Cleveland Drug Co., Shelby.
13714	do.		The Club Café and Candy Kitchen, Asheville, N. C.	The Club Café and Candy Kitchen, Asheville.
13715	Ice-cream, Strawberry.		do.	do.
13840	Ice-cream, Chocolate.		M. F. Courie, Kinston, N. C.	M. F. Courie, Kinston.
13597	Ice-cream, Vanilla.			A. Dughi, Raleigh.
13598	Ice-cream, Chocolate.			do.
13964	Ice-cream, Vanilla.		Fairmont Grocery, Elkin, N. C.	Fairmont Grocery, Elkin.
13634	Ice-cream, Chocolate.		Freeman Drug Co., Burlington, N. C.	Freeman Drug Co., Burlington.
13626	Ice-cream, Vanilla.		do.	W. M. Cook, Haw River.
13908	Ice-cream, Chocolate.		Gibson Drug Co., Concord, N. C.	Gibson Drug Co., Concord.
13907	Ice-cream, Vanilla.		do.	do.
13919	Ice-cream, Chocolate.		Goldsboro Candy Kitchen, Goldsboro, N. C.	Goldsboro Candy Kitchen, Goldsboro.
13650	Ice-cream, Vanilla.		Greensboro Ice-cream Co., Greensboro, N. C.	Greensboro Ice-cream Co., Greensboro.
13657	do.		do.	Conyer's Drug Store, Greensboro.
13695	Ice-cream, Vanilla.		Grimes Drug Co., Hickory, N. C.	Grimes Drug Co., Hickory.
13868	Ice-cream, Vanilla.		Hamlet Candy Kitchen, Hamlet, N. C.	Hamlet Candy Kitchen, Hamlet.
13649	Ice-cream.		Hammer & Kivett, Greensboro, N. C.	Hammer & Kivett, Greensboro.
13984	Ice-cream, Vanilla.		Hawks Drug Co., Mount Airy, N. C.	Hawks Drug Co., Mount Airy.
13618	Ice-cream, Strawberry.		Haywood & Boone, Durham, N. C.	Haywood & Boone, Durham.
13583	Ice-cream, Vanilla.			H. T. Hicks Drug Co., Raleigh.
13584	Ice-cream, Chocolate.			do.
13664	Ice-cream, Vanilla.		High Point Candy Co., High Point, N. C.	High Point Candy Co., High Point.
13665	Ice-cream, Strawberry.		do.	do.
13986	do.		D. M. Hodges, Mount Airy, N. C.	D. M. Hodges, Mount Airy.
13884	Ice-cream, Chocolate.		R. H. Jordan, Charlotte, N. C.	R. H. Jordan, Charlotte.
13893	Ice-cream, Vanilla (Comp.).		Kennedy's Drug Store, Gastonia, N. C.	Kennedy's Drug Store, Gastonia.
13593	Ice-cream, Vanilla.			King-Crowell Drug Co., Raleigh.

CREAMS AND ICE-CREAM SUBSTITUTES—*Continued.*

Laboratory Number.	Fat, Milk, Per Cent.	Solids, Per Cent.	Remarks and Conclusions.
13902	6.10	26.80	Ice-cream, below standard; adulterated; no sign; sale illegal.
13714	11.00	32.80	Ice-cream, vanilla.
13715	9.05	32.60	Ice-cream, strawberry.
13840	12.00	30.80	Ice-cream, chocolate.
13597	7.40	32.24	Ice-cream, compound; no sign, but sold as compound; should be sign in place of business.
13598	5.20	28.84	Ice-cream, chocolate, below standard; no sign, but sold as compound; should be sign in place of business.
13964	6.19	28.30	Ice-cream, below standard; adulterated; no sign; sale illegal.
13634	5.60	29.20	Ice-cream, chocolate, below standard; adulterated; no sign; sale illegal.
13626	6.10	23.00	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13908	8.70	30.71	Ice-cream, chocolate, below standard; adulterated; no sign; sale illegal.
13907	7.70	27.82	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13919	12.60	37.00	Ice-cream, chocolate.
13650	5.70	31.00	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13657	6.00	32.30	do.
13695	6.40	29.00	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13868	2.80	30.30	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13649	4.40	27.70	Ice-cream, below standard; adulterated; no sign; sale illegal.
13984	2.82	29.00	Ice-cream, below standard; adulterated; no sign; sale illegal.
13618	4.30	33.20	Ice-cream, strawberry, below standard; adulterated; no sign; sale illegal.
13583	10.00	38.48	Ice-cream, vanilla.
13584	14.90	40.06	Ice-cream, chocolate.
13664	15.50	32.80	Ice-cream, vanilla.
13665	13.70	32.80	Ice-cream, strawberry.
13986	1.75	29.00	Ice-cream, below standard; adulterated; no sign; sale illegal.
13884	5.80	33.00	Ice-cream, below standard; adulterated; no sign; sale illegal.
13893	4.90	29.10	Ice-cream, compound; sign up; sale legal.
13593	15.40	38.25	Ice-cream, vanilla.

## RESULTS OF THE EXAMINATION OF ICE-

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13896	Ice-cream, Chocolate.		Lincoln Drug Co., Lincolnton, N.C.	Lincoln Drug Co., Lincolnton..
13897	Ice-cream, Vanilla.		do.	do.
13596	do			Love Drug Co., Raleigh.....
13898	Ice-cream, Cherry.		Lowing-Costner Drug Co., Lincolnton, N. C.	Lowing-Costner Drug Co., Lincolnton.
13899	Ice-cream, Vanilla.		do.	do.
13674	Ice-cream, Chocolate.		Main Pharmacy, Salisbury, N. C..	Main Pharmacy, Salisbury.....
13910	Ice-cream, Chocolate.		Marsh Drug Co., Concord, N. C....	Marsh Drug Co., Concord.....
13671	Ice-cream, Vanilla.		J. W. McPherson & Co., Salisbury, N. C.	J. W. McPherson & Co., Salisbury.
13670	Ice-cream, Chocolate.		do.	do.
13662	Ice-cream, Compound.		F. L. Montgomery, High Point, N. C.	F. L. Montgomery, High Point.
13700 Mono Brand	Ice-cream, Strawberry.		Mono Service Cream Co., Knoxville, Tenn.	Beach Bros., Morganton.....
13847	Ice-cream, Peach.		The Montauk Co., Norfolk, Va....	Clark's Cigar Store, New Bern..
13702	Ice-cream, Vanilla.		do.	The Davis Pharmacy, Marion..
13956	do.		J. R. Newman, Reidsville, N. C....	J. R. Newman, Reidsville.....
13967	do.		New York Café, Elkin, N. C....	New York Café, Elkin.....
13969	do.		North Wilkesboro Drug Co., North Wilkesboro, N. C.	North Wilkesboro Drug Co., North Wilkesboro.
13857	Ice-cream, Vanilla.		Orton Confectionery, Wilmington, N. C.	Orton Confectionery, Wilmington.
13858	Ice-cream, Chocolate.		do.	do.
13973	do.		Owens Drug Co., Winston-Salem, N. C.	Owens Drug Co., Winston-Salem.
13972	Ice-cream, Vanilla.		do.	do.
13872	do.		Parsons Drug Co., Wadesboro, N.C.	Parsons Drug Co., Wadesboro..
13873	Ice-cream, Chocolate.		do.	do.
13874	Ice-cream, Vanilla.		Pee Dee Pharmacy, Wadesboro, N. C.	Pee Dee Pharmacy, Wadesboro.
13676	do.		Peerless Baking and Ice-cream Co., Richmond, Va.	James Plummer, Salisbury.....
13839	do.		do.	Temple Drug Co., Kinston.....
13861	Ice-cream, Peach.		J. W. Plummer, Wilmington, N. C..	Mission Pharmacy, Wilmington.
13862	Ice-cream, Vanilla.		do.	do.
13860	do.		do.	J. W. Plummer, Wilmington....
13859	Ice-cream, Strawberry.		do.	do.
13974	Ice-cream, Chocolate.		Polites Candy Kitchen, Winston-Salem, N. C.	Polites Candy Kitchen, Winston-Salem.

CREAMS AND ICE-CREAM SUBSTITUTES—*Continued.*

Laboratory Number.	Fat, Milk, Per Cent.	Solids, Per Cent.	Remarks and Conclusions.
13896	3.90	29.80	Ice-cream, below standard; adulterated; no sign; sale illegal.
13897	3.90	23.60	do.
13596	1.30	25.91	Ice-cream, vanilla, very much below standard; adulterated; no sign; sale illegal.
13898	2.70	32.00	Ice-cream, sherry, below standard; adulterated; no sign; sale illegal.
13899	3.40	28.00	Ice-cream, below standard; adulterated; no sign; sale illegal.
13674	8.90	38.50	Ice-cream, chocolate, below standard; adulterated; no sign; sale illegal.
13910	4.10	27.70	Ice-cream, chocolate, below standard; adulterated; no sign; sale illegal.
13671	7.50	32.90	Ice-cream, vanilla, below standard; adulterated; sale illegal.
13670	8.80	33.50	Ice-cream, chocolate, below standard; adulterated; no sign; sale illegal.
13662	3.10	25.60	Ice-cream, compound; sign up; sale legal.
13700	5.50	33.30	Ice-cream, strawberry, below standard; adulterated; sale illegal.
13847	8.00	30.00	Ice-cream, peach.
13702	8.80	30.70	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13956	0.60	25.70	Ice-cream, below standard; adulterated; no sign; sale illegal.
13967	3.68	21.60	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13969	2.57	24.00	Ice-cream, below standard; adulterated; no sign; sale illegal.
13857	17.80	38.40	Ice-cream, vanilla.
13858	12.90	37.40	Ice-cream chocolate.
13973	10.66	32.80	Ice-cream.
13972	8.28	31.40	Ice-cream, below standard; adulterated; sign does not meet requirements.
13872	2.60	34.10	Ice-cream, vanilla, below standard; sale illegal.
13873	4.50	28.10	Ice-cream, chocolate, below standard; adulterated; no sign; sale illegal.
13874	5.10	27.50	Ice-cream, below standard; adulterated; no sign; sale illegal.
13676	8.50	31.50	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13839	7.50	36.10	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13861	9.00	30.60	Ice-cream, peach.
13862	13.80	34.60	Ice-cream, vanilla.
13860	10.00	34.80	Ice-cream, vanilla.
13859	7.50	34.10	Ice-cream, strawberry, slightly below standard; adulterated; no sign; sale illegal.
13974	8.19	31.70	Ice-cream, below standard; adulterated; no sign; sale illegal.

## RESULTS OF THE EXAMINATION OF ICE-

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13975	-----	Ice-cream, Vanilla	Polites Candy Kitchen, Winston-Salem, N. C.	Polites Candy Kitchen, Winston-Salem.
13900	-----	do.	Purity Dairy Products Co., Charlotte, N. C.	Sloop Drug Co., Shelby
13958	-----	Ice-cream, Chocolate.	Purity Ice-cream Co., Greensboro, N. C.	R. H. Tucker, Reidsville.
13957	-----	Ice-cream, Peach.	do.	do.
13895	-----	do.	Purity Ice-cream Co., Richmond, Va.	Adams Drug Co., Gastonia.
13894	The Velvet Kind.	Ice-cream, Chocolate.	do.	do.
13887	-----	do.	do.	John S. Blake Co., Charlotte.
13890	-----	Ice-cream, Vanilla.	do.	Bowen's Drug Store, Charlotte.
13841	Ice-cream, Velvet.	do.	do.	Chalk's Pharmacy, Morehead City.
13912	do.	Ice-cream.	do.	Davis Drug Co., Concord.
13623	-----	Ice-cream, Chocolate.	do.	Five Points Drug Co., Durham
13836	do.	do.	do.	Floyd Barwick, LaGrange.
13869	do.	Ice-cream, Pineapple.	do.	Fox Drug Co., Hamlet.
13658	The Velvet Kind.	Ice-cream, Vanilla.	do.	Gardner's Drug Store, Greensboro.
13985	Ice-cream, Velvet.	do.	do.	Gwyn Drug Co., Mount Airy.
13987	-----	Ice-cream, Chocolate.	do.	do.
13591	-----	Ice-cream, Peach.	do.	Mallette's Drug Store, Raleigh.
13659	The Velvet Kind.	Ice-cream, Vanilla.	do.	Mann's Drug Store, High Point
13966	Ice-cream, Velvet.	Ice-cream, Peach.	do.	Peoples Drug Store, Elkin.
13960	-----	Ice-cream, Chocolate.	do.	Piedmont Grocery Co., Reidsville.
13864	Ice-cream, Velvet.	Ice-cream, Peach.	do.	Pope Drug Co., Lumberton.
13863	do.	Ice-cream, Vanilla.	do.	do.
13961	-----	Ice-cream, Chocolate.	do.	Variety Store, No. 2, Leaksville.
13978	-----	Ice-cream, Vanilla.	Racey Ice-cream Co., Knoxville, Tenn.	James A. Hutchins, Winston-Salem.
13979	-----	Ice-cream, Chocolate.	do.	do.
13716	-----	Ice-cream, Vanilla.	do.	Smith's Drug Store, Asheville.
13711	-----	Ice-cream, Vanilla.	Rayson's Drug Store, Asheville, N. C.	Rayson's Drug Store, Asheville.
13710	-----	Ice-cream, Strawberry.	do.	do.

CREAMS AND ICE-CREAM SUBSTITUTES—*Continued.*

Laboratory Number.	Fat, Milk, Per Cent.	Solids, Per Cent.	Remarks and Conclusions.
13975	10.00	33.20	Ice-cream.
13900	13.70	30.30	Ice-cream, vanilla.
13958	8.34	34.10	Ice-cream, below standard; adulterated; no sign; sale illegal.
13957	6.56	34.30	do.
13895	5.70	38.90	Ice-cream, peach, below standard; adulterated; no sign; sale illegal.
13894	8.90	41.90	Ice-cream, below standard; adulterated; no sign; sale illegal.
13887	11.70	32.00	Ice-cream.
13890	6.60	27.40	Ice-cream, below standard; adulterated; no sign; sale illegal.
13841	8.50	30.70	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13912	7.90	33.40	Ice-cream, below standard; adulterated; no sign; sale illegal.
13623	6.80	34.90	Ice-cream, chocolate, below standard; adulterated; no sign; sale illegal.
13836	6.60	34.70	Ice-cream, below standard; adulterated; no sign; sale illegal.
13869	8.30	31.90	Ice-cream, pineapple.
13658	7.20	31.70	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13985	8.43	34.50	Ice-cream, below standard; adulterated; no sign; sale illegal.
13987	6.61	34.20	do.
13591	3.60	35.39	Ice-cream, peach, below standard; adulterated; no sign; sale illegal.
13659	8.10	32.30	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13966	5.70	34.80	Ice-cream, below standard; adulterated; no sign; sale illegal.
13960	10.20	34.80	Ice-cream.
13864	5.70	34.60	Ice-cream, peach, below standard; adulterated; no sign; sale illegal.
13863	7.00	34.60	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13961	10.70	35.70	Ice-cream.
13978	13.01	35.40	do.
13979	10.35	35.10	do.
13716	10.80	30.70	Ice-cream, vanilla.
13711	13.60	33.90	do.
13710	13.40	35.70	Ice-cream, strawberry.

## RESULTS OF THE EXAMINATION OF ICE-

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13865	-----	Ice-cream, Vanilla.	Robeson Drug Co., Maxton, N. C.	Robeson Drug Co., Maxton. . .
13835	-----	Ice-cream	John O. Royal, Goldsboro, N. C.	W. H. Burk & Son, LaGrange. .
13832	-----	Ice-cream, Chocolate.	do. . . . .	Royal Fruit Store, Goldsboro. .
13831	-----	Ice-cream, Vanilla.	do. . . . .	do. . . . .
13834	-----	do. . . . .	do. . . . .	Williams' Drug Store, Goldsboro
13852	-----	Ice-cream	Royal Ice-cream Co., New Bern, N. C.	Royal Ice-cream Co., New Bern
13851	-----	do. . . . .	do. . . . .	do. . . . .
13691	-----	Ice-cream, Chocolate.	A. B. Saleeby & Co., Salisbury, N. C.	Hall's Drug Co., Statesville. . .
13679	-----	Ice-cream, Vanilla.	do. . . . .	A. B. Saleeby, Salisbury. . . .
13678	-----	Ice-cream, Cherry.	do. . . . .	do. . . . .
13913	Ice-cream, W. H. S. Brand.	Ice-cream, Vanilla.	W. H. Scarborough, Concord, N. C.	W. H. Scarborough, Concord. .
13914	do. . . . .	Ice-cream, Strawberry.	do. . . . .	do. . . . .
13915	do. . . . .	Ice-cream	do. . . . .	do. . . . .
13916	do. . . . .	do. . . . .	do. . . . .	do. . . . .
13917	do. . . . .	do. . . . .	do. . . . .	do. . . . .
13693	-----	Ice-cream, Vanilla.	C. M. Shuford, Hickory, N. C.	C. M. Shuford, Hickory. . . . .
13838	-----	Ice-cream	J. T. Skinner & Son, Kinston, N. C.	J. T. Skinner & Son, Kinston. .
13837	-----	do. . . . .	do. . . . .	do. . . . .
13845	-----	Ice-cream, Chocolate.	do. . . . .	Woodlane Drug Co., New Bern. .
13690	-----	Ice-cream, Vanilla.	Statesville Drug Co., Statesville, N. C.	Statesville Drug Co., States- ville.
13656	-----	Ice-cream, Chocolate.	The Sugar Bowl, Greensboro, N. C.	The Sugar Bowl, Greensboro. . .
13655	-----	Ice-cream, Vanilla.	do. . . . .	do. . . . .
13981	-----	Ice-cream, Chocolate.	The Sweet Shop, Winston-Salem, N. C.	The Sweet Shop, Winston- Salem.
13980	-----	Ice-cream	do. . . . .	do. . . . .
13976	-----	do. . . . .	Thompson's Drug Store, Winston- Salem, N. C.	Thompson's Drug Store, Win- ston-Salem.
13977	-----	Ice-cream, Vanilla.	do. . . . .	do. . . . .
13892	-----	Ice-cream, Chocolate.	Torrence Drug Co., Gastonia, N. C.	Torrence Drug Co., Gastonia. . .
13878	-----	Ice-cream, Vanilla.	The Union Drug Co., Monroe, N. C.	The Union Drug Co., Monroe. . .
13594	-----	Ice-cream, Chocolate.	do. . . . .	Wake Drug Co., Raleigh. . . . .
13595	-----	Ice-cream, Vanilla.	do. . . . .	do. . . . .
13599	-----	Ice-cream, Chocolate.	do. . . . .	White Ice-cream Co., Raleigh. .

CREAMS AND ICE-CREAM SUBSTITUTES—*Continued.*

Laboratory Number.	Fat, Milk, Per Cent.	Solids, Per Cent.	Remarks and Conclusions.
13855	9.30	28.00	Ice-cream, slightly below standard; adulterated; no sign; sale illegal.
13835	5.10	32.80	Ice-cream, below standard; adulterated; no sign; sale illegal.
13832	3.00	32.00	Ice-cream, much below standard; adulterated; no sign; sale illegal.
13831	6.30	29.60	Ice-cream, below standard; adulterated; no sign; sale illegal.
13834	7.40	29.70	Ice-cream, below standard; adulterated; no sign; sale illegal.
13852	7.10	43.70	do.
13851	7.60	37.80	do.
13691	8.00	31.60	Ice-cream, chocolate, below standard; adulterated; no sign; sale illegal.
13679	13.50	36.00	Ice-cream, vanilla.
13678	8.70	29.90	Ice-cream, fruit.
13913	2.40	27.80	Ice-cream, vanilla, much below standard; adulterated; no sign; sale illegal.
13914	2.50	27.80	Ice-cream, strawberry, much below standard; adulterated; no sign; sale illegal.
13915	2.50	29.70	Ice-cream, much below standard; adulterated; no sign; sale illegal.
13916	2.90	28.90	do.
13917	2.90	32.10	do.
13693	13.70	30.10	Ice-cream, vanilla.
13838	4.60	29.20	Ice-cream, chocolate, below standard; adulterated; no sign; sale illegal.
13837	3.50	29.10	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13845	5.30	29.60	Ice-cream, chocolate, below standard; adulterated; no sign; sale illegal.
13690	8.50	27.40	Ice-cream, below standard; adulterated; sign up; sale illegal.
13656	15.50	37.40	Ice-cream, chocolate.
13655	16.40	37.00	Ice-cream, vanilla.
13981	3.99	33.30	Ice-cream, below standard; adulterated; no sign; sale illegal.
13980	4.18	31.40	do.
13976	7.69	22.60	Ice-cream, below standard; adulterated; no sign; sale illegal.
13977	8.04	30.50	do.
13892	3.20	27.60	Ice-cream, below standard; adulterated; no sign; sale illegal.
13878	13.70	32.90	Ice-cream, vanilla.
13594	14.30	39.85	Ice-cream, chocolate.
13595	10.60	34.22	Ice-cream, vanilla.
13599	5.30	33.50	Ice-cream, chocolate, below standard; adulterated; no sign; sale illegal.

## RESULTS OF THE EXAMINATION OF ICE-

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13600	Ice-cream, Vanilla.			White Ice-cream Co., Raleigh..
13855	do.		Warren Candy Co., Wilmington, N. C.	Warren Candy Co., Wilmington
13856	Ice-cream, Chocolate.		do.	do.
13404	Ice-cream		Watson's Pharmacy Co., Southport, N. C.	Watson's Pharmacy Co., Southport.
13689	Ice-cream, Vanilla.		White Pine Creamery Co., Asheville, N. C.	Joe Hamoy Ice-cream Parlor, Statesville.
13701	do.		do.	J. W. Streetman, Marion.
13854	do.		Woodall & Shepherd, Wilmington, N. C.	Woodall & Shepherd, Wilmington.
13853	Ice-cream		do.	do.

## LARD AND COMPOUND LARD.

## DEFINITIONS AND STANDARDS.

1. *Lard* is the rendered fresh fat from hogs in good health at the time of slaughter, is clean, free from rancidity, and contains, necessarily incorporated in the process of rendering, not more than one (1) per cent of substances, other than fatty acids and fat.

2. *Leaf lard* is lard rendered at moderately high temperatures from the internal fat of the abdomen of the hog, excluding that adherent to the intestines, and has an iodine number not greater than sixty (60).

3. *Neutral lard* is lard rendered at low temperatures.

## RESULTS OF THE EXAMINATION OF LARDS.

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13534	Lard		Armour & Co., Greensboro, N. C.	Smith Grocery Co., Lexington
12671	Compound Lard*			Armstrong Grocery Co., New Bern.
13532	White Dome	Lard Compound.	Capital Refining Co., Washington, D. C.	M. A. Gilmore & Co., Wadesboro.
13524	Sunny South, Compound.	do.	Corkran-Hill Co., Baltimore, Md.	W. T. Buchanan, Sanford.
13533	Silver Crest	Lard	Jacob Dold, Richmond, Va.	M. A. Gilmore & Co., Wadesboro.

CREAMS AND ICE-CREAM SUBSTITUTES—*Continued.*

Laboratory Number.	Fat, Milk, Per Cent.	Solids, Per Cent.	Remarks and Conclusions.
13600	2.90	29.79	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13855	5.30	31.50	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13856	6.40	34.90	Ice-cream, chocolate, below standard; adulterated; no sign; sale illegal.
13404	12.20	-----	Ice-cream.
13689	6.80	30.40	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.
13701	8.20	31.60	do.
13854	4.70	26.00	Ice-cream, chocolate, below standard; adulterated; no sign; sale illegal.
13853	6.60	26.00	Ice-cream, vanilla, below standard; adulterated; no sign; sale illegal.

There is no standard for compound lard, it being a mixture or compound of fats, but as found on the market it is usually cotton-seed oil with enough beef stearin (oleostearin) to give it the requisite degree of solidity or consistence and a small amount of real lard. Lard stearin or cotton-seed stearin may be used in place of the beef stearin.

Fifteen samples of lard and lard substitutes have been examined during the year, and two of them were sold as lard when they were compound lards.

The sale of compound lard is all right, provided it is sold as compound lard; but the sale of a compound lard as lard is a violation of the law, and will have to be prosecuted.

## COMPOUND LARDS AND LARD SUBSTITUTES.

Laboratory Number.	Halphen Test for Cotton-seed Oil.	Reading Refractometer, 40° C.	Refractive Index.	Iodine Number (Hanus).	Remarks and Conclusions.
13534	Negative....	52.0	1.4607	63.3	Lard.
12671	Positive....	56.5	1.4636	-----	Compound lard.
13532	do.....	60.0	1.4659	97.4	Lard, compound.
13524	do.....	58.0	1.4646	90.3	Compound lard.
13533	Negative....	53.0	1.4613	58.8	Lard.

## RESULTS OF THE EXAMINATION OF LARDS, COM

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13531	Ladina, Compound of Cotton-seed Oil.	Lard .....	W. S. Forbes & Co., Richmond, Va.	G. W. Goodwin, Laurinburg.
13529	Pure Lard, White Star.	Lard, Pure.	G. H. Hammond Co.....	W. D. Wright, Laurinburg....
13528	Lard, Pure Family, Daisy.	Lard.....	John Hoffman's Co., Cincinnati, Ohio.	F. L. Orr, Maxton.....
13536	.....	do.....	.....	J. F. Jamison, Charlotte.....
13525	Lard, Pure Open Kettle Rendered, Virginia.	do.....	Kingan & Co., Richmond, Va.	Ellis & Co., Wilson.....
13526	Rendered Hog Fat, U. S. Inspected and Passed.	do.....	B. W. Phillips, Maxton, N. C.	R. H. Strickland, Maxton....
13530	Flake White.....	do.....	The Proctor & Gamble Co., Macon, Ga.	H. A. McCoy, Laurinburg....
13535	.....	Lard, Compound.	do.....	C. M. Fite, Charlotte.....
13527	Lard, Pure, Laurel Leaf.	Lard, Pure.	Sulzberger & Sons Co., Fayetteville, N. C.	M. L. McRae, Maxton.....
13523	Lard, Sulzberger's Majestic Kettle Rendered.	do.....	do.....	Hamilton Supply Co., Red Springs.

\*Sent to the Department for analysis.

## LEMON EXTRACTS AND LEMON EXTRACT SUBSTITUTES.

## DEFINITIONS AND STANDARDS.

Lemon extract is the flavoring extract prepared from oil of lemon, or from lemon peel, or both, and contains not less than 5 per cent by volume of oil of lemon.

Oil of lemon is the volatile oil obtained from the fresh peel of the lemon.

Terpeneless extract of lemon is the flavoring extract prepared by shaking oil of lemon with dilute alcohol, or by dissolving terpeneless oil of lemon in dilute alcohol, and contains not less than two-tenths (0.2) per cent by weight of citral, derived from oil of lemon.

Compound lemon extract is the flavoring product containing more than 50 per cent of lemon extract with some other flavoring as a substitute for lemon, such as citral, etc.

POUND LARDS AND LARD SUBSTITUTES—*Continued.*

Laboratory Number.	Halphen Test for Cotton-seed Oil.	Reading Refractometer, 40° C.	Refractive Index.	Iodine Number (Hanus).	Remarks and Conclusions.
13531	Positive.....	60.0	1.4659	97.7	Compound lard, sold by dealer as lard; misrepresented; sale illegal.
13529	Negative.....	52.0	1.4607	60.8	Lard.
13528	....do.....	52.5	1.4610	58.0	do.
13536	....do.....	52.0	1.4607	63.5	do.
13525	....do.....	53.0	1.4613	58.1	do.
13526	....do.....	53.0	1.4613	61.9	do.
13530	Positive.....	60.0	1.4659	93.9	Compound lard, sold by retail dealer as lard; misrepresented; sale illegal.
13535	....do.....	60.0	1.4659	98.2	Compound lard.
13527	Negative.....	53.0	1.4613	64.1	Lard.
13523	....do.....	51.0	1.4600	58.6	do.

Imitation lemon extract is a flavoring product made from citral or other substitutes for lemon oil, and contains little or no lemon oil.

Substitutes for lemon extract are usually of very little value as a flavoring material; but if properly labeled or branded just what they are, their sale is legal, provided they contain nothing deleterious to health, such as wood alcohol, etc. Wood alcohol is a dangerous poison. A small amount is liable to produce death, and even a smaller amount may produce total and permanent blindness.

Consumers should observe the label and demand the real extract, as it is worth far more than the difference in the price between the substitute and the real extract.

Results of the examination of the samples for the year are printed in the table below.

## RESULTS OF THE EXAMINATION OF LEMON

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13445	Lemon Extract.....	Ahrens Bros., Wilmington, N. C....	H. W. Konig, Wilmington.....
13924	do.....	do.....	Barden Bros., Wilmington.....
13456	Lemon Extract, Pure Food, Sunbeam.	Austin-Nichols Co., New York, N. Y.	P. & R. Grocery Co., Southern Pines.
12922	Lemon Flavoring, Bailey's Standard Dime.	Bailey, James, & Son, Baltimore, Md.	Turnage Bros., Ayden.....
13446	Lemon Extract, Bastine's Pure.	Bastine & Co., New York, N. Y....	Cape Fear Cash Grocery, Wilmington.
13447	Lemon Extract.....	Bellamy, Robert R., Wilmington, N. C.	Henry Wentzensen, Wilmington
13925	do.....	do.....	R. L. Burton, Wilmington.....
13472	Lemon Extract, Eclipse Brand.	Brauer, Charles E., Co., Richmond, Va.	J. G. Williams, Chapel Hill....
14135	Lemon Extract, Brame's....	Brame Drug Co., North Wilkesboro, N. C.	Brame Drug Co., North Wilkesboro.
13495	Lemon Extract, Lockett's Pure.	Bristol Drug and Gum Co., Bristol, Va.-Tenn.	The Atkinson Co., Elkin.....
13501	Lemon Extract, Warranted Pure, Burnett's.	Burnett, Joseph, Co., Boston, Mass.	Oppenheimer's, Rocky Mount..
14133	Lemon Extract, Terpeneless, 75% Alcohol.	Burwell & Dunn Co., Charlotte, N. C.	C. C. Sanford Sons Co., Mocksville.
12914	Lemon, Essence, 90% Alcohol.	Chalk, S. A., Morehead City, N. C..	J. B. Morton, Morehead City...
12913	Lemon Extract, C. C. C. Brand.	Clotworthy Chemical Co., Baltimore, Md.	W. R. Crow, Goldsboro.....
13458	do.....	do.....	D. C. Braswell, Wilson.....
13443	Phoenix Brand.....	Crawford, W. H., & Co., Baltimore, Md.	J. C. Peterson, Clinton.....
13496	Lemon and Citral, Crown Brand.	Crown Chemical Co., Baltimore, Md.	The Atkinson Co., Elkin.....
13492	do.....	do.....	A. G. Bowman & Son, Mount Airy.
14125	Lemon, Imitation Flavoring, Swan, Artificially Colored.	Cumberland Mfg. Co., Nashville, Tenn.	Mrs. Richard Gibson, Asheville.
13926	Windsor Brand.....	do.....	Southern Grocery Co., Wilmington.
14130	Lemon, Dill's Extract.....	Dill (The) Medicine Co., Norristown, Pa.	Carolina Warehouse, Greensboro.
13476	Lemon, Cherokee Flavor....	Englehard, A., & Sons Co., Louisville, Ky.	Reidsville Brokerage Co., Reidsville.
13461	Lemon, Imitation Flavor, Dr. Fenner's.	Fenner, M. M., Co., Fredonia, N. Y.	S. Meyer, Enfield.....
12920	Lemon Extract, Golden Horse Shoe.	Four (The) Company, Norfolk, Va..	L. S. Landing, Plymouth.....
13452	Lemon Flavor, P. & S. Brand	Frank Tea and Spice Co., Cincinnati, Ohio.	R. J. Wheeler, Dunn.....
13462	Lemon Extract, Dove Brand.	do.....	Lawrence Bros., Enfield.....
13442	Lemon Extract, Blue Ribbon.	Greever-Lotspeich Mfg. Co., Knoxville, Tenn.	S. H. Youngblood, Charlotte...
12915	Lemon Extract, Baker's Pure.	do.....	A. J. Cox & Co., Washington...
13481	Lemon, Essence.....	Greensboro Drug Co., Greensboro, N. C.	Greensboro Drug Co., Greensboro.

## EXTRACTS AND LEMON EXTRACT SUBSTITUTES.

Laboratory Number.	Oil of Lemon by Precipitation—Per Cent by Volume.	Oil of Lemon by Polarization—Per Cent by Volume.	Reading Refractometer on Oil, 15.5° C.	Refractive Index of Oil.	Specific Gravity, 15.6° C.	Alcohol (by Volume)—Per Cent.	Remarks and Conclusions.
13445	5.00		75.6	1.4756			Lemon extract.
13924	0.00	0.00					Imitation lemon extract; misbranded; contains no oil of lemon; sale illegal.
13456	6.40	6.50	75.6	1.4756		84.20	Lemon extract.
12922	5.00	5.30	75.3	1.4756	0.85246	78.82	do.
13446	5.60	5.80	75.6	1.4756		78.11	do.
13447	5.90	5.90	75.6	1.4756		86.90	do.
13925	5.60	5.90	74.7	1.4753			do.
13472	6.10	6.20	75.6	1.4756		77.74	do.
14135	4.20	4.20	76.0	1.4759	0.86505	75.28	Lemon extract, below standard; adulterated; misbranded; sale illegal.
13495	4.80	5.00	75.6	1.4756		87.72	Lemon extract.
13501	10.10	10.30	75.6	1.4756		83.00	Lemon extract, concentrated.
14133	0.00	0.00			0.87348	76.40	Terpeneless extract lemon.
12914	4.20		75.3	1.4756	0.82501	88.46	Lemon extract, below standard; adulterated; misbranded; sale illegal.
12913	5.20	5.40	75.3	1.4756	0.82395	87.74	Lemon extract.
13458	5.90	6.10	75.6	1.4756		86.74	do.
13443	6.40	6.60	75.6	1.4756		84.00	do.
13496	0.00	0.00			0.96188	33.04	Imitation lemon extract; misbranded; sale illegal.
13492	0.00	0.00			0.96127	33.60	do.
14125	0.00	0.00			0.93186	51.45	Imitation lemon extract.
13926	5.30	5.20	74.7	1.4753			Lemon extract.
14130	4.90	5.00	76.0	1.4759	0.83063	86.10	do.
13476	0.00	0.90	75.6	1.4756			Lemon extract substitute; misbranded; sale illegal.
13461	2.60	2.50	75.6	1.4756		65.00	Imitation lemon extract.
12920	5.20	6.00	75.3	1.4756	0.82449	86.80	Lemon extract.
13452	0.00	0.00				29.12	Imitation lemon extract; misbranded; was branded on carton, lemon flavor; sale illegal.
13462	6.00		75.6	1.4756		78.37	Lemon extract.
13442	10.70	11.20	75.6	1.4756		83.00	Lemon extract, double strength.
12915	8.40		75.3	1.4756	0.81901	85.86	Lemon extract, concentrated.
13481	6.70	6.80	75.6	1.4756		86.00	Lemon extract.

## RESULTS OF THE EXAMINATION OF LEMON EXTRACTS

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13480	Lemon Extract.....	Grissom-Sykes Drug Co., Greensboro, N. C.	Grissom-Sykes Drug Co., Greensboro.
13488	Lemon Extract, Harris' Fruit, Highly Concentrated.	Harris (The) Company, New York, N. Y.	Efird Bros., Winston-Salem....
14137	Lemon Extract, Heekin's White Cap.	Heekin Spice Co., Cincinnati, Ohio.	J. R. Cummings, Winston-Salem.
13459	Lemon Extract, Heekin's "Deer's Head."	.....do.....	Cummings Grocery Co., Tarboro.
14126	Lemon Extract, Hite's Pure..	Hite, S. P., Co., Roanoke, Va.....	Shipman Bros., Hendersonville.
14132	Lemon, Kitchen Queen.....	Interstate Chemical Co., Baltimore, Md.	C. Scott & Co., Greensboro....
13451	Lemon Extract, I. C.....	Interstate Commerce Co., Richmond, Va.	Wallace Grocery, Smithfield....
12912	Lemon Extract, Old Dominion, Terpeneless.	.....do.....	J. G. Derr, Goldsboro.....
13489	.....do.....	.....do.....	W. J. Swanson, Pilot Mountain.
13444	Lemon, Old Dominion, Terpeneless.	.....do.....	J. C. Peterson, Clinton.....
13482	Lemon, Kitchen Queen.....	Interstate Chemical Co., Baltimore, Md.	S. S. Morris, Greensboro.....
13460	Lemon Extract, Eagle Brand.	Kent Drug Co., Baltimore, Md.....	S. Meyer, Enfield.....
13469	Lemon Extract.....	King, C. E., & Sons, Durham, N. C.	C. E. King & Sons, Durham....
13450	.....do.....	King, W. H., Drug Co., Raleigh, N. C.	Ashley Horne & Son, Clayton..
13477	Lemon Extract, Silver Medal.	McCormick & Co., Baltimore, Md..	Troxler Bros., Greensboro.....
14131	Lemon Extract, McIlhenny's Pure Concentrated.	McIlhenny, E., & Co., New Iberia, La.	Patterson Bros., Greensboro....
13923	Lemon Extract, Miller's.....	Miller Mfg. Co., New York, N. Y....	E. B. Hackburn, New Bern.....
14139	Lemon Flavoring, N. P. D. Brand.	Norman-Perry Drug Co., Winston-Salem, N. C.	Rural Hall Supply Co., Rural Hall.
13475	.....do.....	.....do.....	Borland & Ford, Reidsville....
13473	.....do.....	.....do.....	L. B. McAdams & Son, Burlington.
13485	Lemon Extract, N. P. D. Brand.	.....do.....	Swain & Johnson, Washington..
13448	Lemon Flavoring, N. P. D. Brand.	.....do.....	M. A. Gilmore & Co., Wadesboro.
13463	Lemon Extract, Owens & Minor's.	Owens & Minor Drug Co., Richmond, Va.	M. C. Braswell, Battleboro....
13449	Lemon, Parke's Pure.....	Parke, L. H., & Co., Philadelphia, Pa.	M. Waller, Monroe.....
13454	Lemon Flavoring, Pure, A. A. ....	.....do.....	C. V. Williams & Co., Hamlet..
13470	Lemon Extract, Peabody.....	Peabody Drug Co., Durham, N. C..	Peabody Drug Co., Durham....
14138	Lemon Extract, Pilot Brand..	Pilot Drug Co., Winston-Salem, N. C.	Pilot Drug Co., Winston-Salem.
13479	Reif's Extract Lemon.....	Reif (The Charles) Co., Chattanooga, Tenn.	John E. Sockwell, Greensboro..
14136	Lemon Extract, Full Strength, Pure.	Sampson Medicine Co., Winston-Salem, N. C.	Sampson Medicine Co., Winston-Salem.
13474	Lemon Extract, Colored.....	.....do.....	R. L. Clapp & Pool, Graham....
13440	Lemon Extract, Artificially Colored.	.....do.....	Lopp Bros., Lexington.....
13486	.....do.....	.....do.....	C. H. Lloyd, Winston-Salem....
13490	Lemon Extract, Best by Test..	.....do.....	W. W. Thomas, Mount Airy....

## AND LEMON EXTRACT SUBSTITUTES—Continued.

Laboratory Number.	Oil of Lemon by Precipitation—Per Cent by Volume.	Oil of Lemon by Polarization—Per Cent by Volume.	Reading Refractometer on Oil, 15.5° C.	Refractive Index of Oil.	Specific Gravity, 15.6° C.	Alcohol (by Volume)—Per Cent.	Remarks and Conclusions.
13480	4.30	4.40	75.6	1.4756	-----	88.69	Lemon extract, below standard; adulterated; misbranded; sale illegal.
13488	0.00	0.00	-----	-----	0.97690	19.40	Imitation lemon flavor; misbranded; was branded fruit extract lemon; sale was illegal.
14137	5.40	5.50	76.0	1.4759	0.84237	82.05	Lemon extract.
13459	5.20	5.50	75.6	1.4756	-----	82.16	do.
14126	5.60	5.70	76.0	1.4759	0.84301	81.64	do.
14132	6.40	6.50	76.0	1.4759	0.83837	82.26	do.
13451	5.60	-----	75.6	1.4756	-----	77.28	do.
12912	0.00	0.00	-----	-----	0.93585	49.37	Terpeneless lemon extract.
13489	0.00	0.00	-----	-----	0.97344	22.70	Imitation lemon extract.
13444	0.00	0.00	-----	-----	-----	48.70	Terpeneless lemon extract; branded terpeneless lemon; misbranded; sale illegal.
13482	5.40	5.60	75.6	1.4756	0.82450	83.20	Lemon extract.
13460	0.00	0.00	-----	-----	-----	-----	Terpeneless extract lemon; misbranded; sale illegal.
13469	5.00	5.10	75.6	1.4756	-----	87.80	Lemon extract.
13450	6.20	6.40	75.6	1.4756	-----	87.50	do.
13477	0.00	0.00	-----	-----	0.92590	54.26	Imitation lemon extract.
14131	6.40	6.50	76.0	1.4759	0.84237	81.05	Lemon extract.
13023	6.80	6.80	74.7	1.4753	-----	-----	do.
14139	4.30	4.40	76.0	1.4759	0.82220	89.10	Lemon extract, below standard; adulterated; misbranded; sale illegal.
13475	4.40	4.40	75.6	1.4756	-----	83.97	do.
13473	3.80	4.00	75.6	1.4756	-----	75.57	do.
13485	4.40	4.40	75.6	1.4756	-----	80.00	do.
13448	4.40	4.40	75.6	1.4756	-----	78.60	do.
13463	-----	5.50	75.6	1.4756	-----	85.00	Lemon extract.
13449	5.90	6.00	75.6	1.4756	-----	87.76	Lemon extract; misbranded; is branded lemon when it is an extract; sale illegal.
13454	5.60	5.90	75.6	1.4756	-----	88.33	Lemon extract.
13470	5.30	5.40	75.6	1.4756	-----	88.42	do.
14138	2.70	2.50	76.0	1.4759	0.88172	70.66	Lemon extract, below standard; misbranded; sale illegal.
13479	0.00	0.00	-----	-----	-----	49.13	Terpeneless lemon extract; adulterated; misbranded; sale illegal.
14136	3.90	4.00	76.0	1.4759	0.86421	75.79	Lemon extract, below standard; adulterated; misbranded; sale illegal.
13474	2.00	2.00	75.6	1.4756	-----	74.35	do.
13440	3.20	3.00	75.6	1.4756	-----	77.52	do.
13486	2.20	2.10	75.6	1.4756	-----	70.18	do.
13490	3.40	3.40	75.6	1.4756	-----	80.75	do.

## RESULTS OF THE EXAMINATION OF LEMON EXTRACTS

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13491	Lemon Extract, Best by Test	Sampson Medicine Co., Winston-Salem, N. C.	W. W. Thomas, Mount Airy.....
14128	Lemon Extract, Hart's Pure, Excellence.	Sanford, Chamberlain & Albers Co., Winston-Salem, N. C.	S. A. DeHart & Co., Bryson City.
14134	Lemon Extract, Scott's Pure Flavoring.	Scott, John M., & Co., Charlotte, N. C.	J. L. Clement, Mocksville.....
13467	Lemon Extract.....	Sharpe & Dohme, Baltimore, Md.	A. V. Baucom Pharmacy, Apex.
14127	Lemon Flavor, Artificially Colored.	Smith, Dr. T. C., Asheville, N. C.	J. H. Dorsey, Bryson City.....
13922	Spartan Brand.....	Southern Chemical Co., Petersburg, Va.	Hardy Hill, Kinston.....
13493	Lemon Extract, Harmless Colored.	Surry Drug Co., Elkin, N. C.	Elk Grocery Co., Elkin.....
13457	Lemon Extract, Pure, Votan Brand.	Reily-Taylor Co., New Orleans, La.	Carroll Grocery Co., Wilson....
14129	Lemon Extract, R. C. C. Brand.	Retailers' Coöperative Corporation, Salem, Va.	E. M. Towns, Reidsville.....
13497	Lemon Extract, Sanders' Cream of Fruit.	Royal Remedy and Extract Co., Dayton, Ohio.	The Atkinson Co., Elkin.....
13466	Lemon Extract, Sanders'.....	do.....	W. A. Whitaker, Apex.....
13483	Lemon Extract, Our Seal Brand.	Vaughn-Crutchfield Co., Winston-Salem, N. C.	Vogler & Hegge, Waughtown...
13441	do.....	do.....	Finch Bros., Lexington.....
13455	do.....	do.....	D. McNair, Hamlet.....
13464	do.....	do.....	I. Pearce & Co., Henderson.....
13471	do.....	do.....	J. G. Williams, Chapel Hill.....
13453	Lemon Extract, Watkins'.....	Watkins, J. R., Medical Co., Winona, Minn.	J. F. Powers & Son, Fayetteville.
13465	Lemon Extract, Eagle.....	Webb Mfg. Co., Nashville, Tenn.	J. D. Kelly, Durham.....
13927	Lemon Extract, Eagle Brand.	do.....	M. A. McSwain & Son, Shelby..
13494	Lemon Extract, Pilot Brand..	Winston Drug Co., Winston-Salem, N. C.	The Atkinson Co., Elkin.....
13487	do.....	do.....	W. B. Horn & Son, Winston-Salem.
13484	do.....	do.....	Bodenheimer Bros., Waughtown.
13498	Lemon Extract, Pure, 20th Century.	Terry-Taylor Drug Co., Norfolk, Va.	Miller Grocery Co., North Wilkesboro.
13468	Lemon Extract.....	Thomas Drug Co., West Durham, N. C.	Thomas Drug Co., West Durham.

## MAPLE SIRUP AND MAPLE SIRUP SUBSTITUTES.

## DEFINITIONS AND STANDARDS.

Sirup is the sound product made by purifying and evaporating the juice of a sugar-producing plant without removing any of the sugar.

Maple sirup is sirup made by the evaporation of maple sap or by the solution of maple concrete, and contains not more than 32 per cent of water and not less than 0.45 per cent of maple sirup ash.

AND LEMON EXTRACT SUBSTITUTES—*Continued.*

Laboratory Number.	Oil of Lemon by Precipitation—Per Cent by Volume.	Oil of Lemon by Polarization—Per Cent by Volume.	Reading Refractometer on Oil, 15.5° C.	Refractive Index of Oil.	Specific Gravity, 15.6° C.	Alcohol (by Volume)—Per Cent.	Remarks and Conclusions.
13491	3.60	3.40	75.6	1.4756	-----	76.70	Lemon extract, below standard; adulterated; misbranded; sale illegal.
14128	6.20	6.10	76.0	1.4759	0.81821	88.36	Lemon extract.
14134	5.50	5.60	76.0	1.4759	0.84736	80.32	do.
13467	4.60	4.70	75.6	1.4756	-----	84.41	Lemon extract, slightly below standard; adulterated; sale illegal.
14127	5.20	5.30	76.0	1.4759	0.82060	88.65	Lemon extract.
13922	5.80	6.00	74.7	1.4753	-----	-----	do.
13493	3.40	3.50	75.6	1.4756	-----	89.85	Lemon extract, below standard; adulterated; misbranded; sale illegal.
13457	5.60	5.30	75.6	1.4756	-----	86.56	Lemon extract.
14129	5.40	5.60	76.0	1.4759	0.81982	88.65	do.
13497	5.90	5.90	75.6	1.4756	-----	79.52	do.
13466	5.20	5.50	75.6	1.4756	-----	82.22	do.
13483	4.40	4.50	75.6	1.4756	-----	81.75	Lemon extract, below standard; adulterated; misbranded; sale illegal.
13441	4.60	4.70	75.6	1.4756	-----	76.76	do.
13455	6.40	6.40	75.6	1.4756	-----	86.40	Lemon extract.
13464	4.60	4.70	75.6	1.4756	-----	82.92	Lemon extract, slightly below standard; adulterated; sale illegal.
13471	4.40	4.40	75.6	1.4756	-----	82.63	Lemon extract, below standard; adulterated; misbranded; sale illegal.
13453	5.00	5.30	75.6	1.4756	-----	85.63	Lemon extract.
13465	5.40	5.50	75.6	1.4756	-----	81.77	do.
13927	5.20	5.30	74.7	1.4753	-----	-----	do.
13494	6.20	-----	75.6	1.4756	-----	74.32	do.
13487	3.40	3.30	75.6	1.4756	-----	74.36	Lemon extract, below standard; adulterated; misbranded; sale illegal.
13484	4.00	-----	75.6	1.4756	-----	73.67	do.
13498	0.00	0.00	-----	-----	-----	45.71	Imitation lemon extract; adulterated; misbranded; sale illegal.
13468	1.80	1.60	75.6	1.4756	-----	69.31	Lemon extract, much below standard; adulterated; misbranded; sale illegal.

The principal adulteration found in maple sirup is the addition of refiner's sugar sirup, the maple sirup present being depended on to flavor the whole, though the maple flavor is often reinforced by the addition of an extract of bark or an imitation flavor. Before the food laws were enforced maple sirups were adulterated with glucose sirup and the imitation flavor; but as maple sirup consists largely of sucrose or ordinary sugar, the presence of added cane sugar is more difficult to detect than the presence of glucose sirup. However, the addition of cane sugar

sirup can be detected by the determination of minor constituents which occur in maple products only.

The manufacturers of these products often use labels that, while not in open violation of the law, are easily misleading to the unsuspecting

## RESULTS OF THE EXAMINATION OF MAPLE

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13423	Sirup, Table, Cane and Maple, Standard.	Sirup, Table..	The American Preserve Co., Philadelphia, Pa.	M. S. Jeffress, Greensboro....
13417	Sirup, Maple, Pure Food, Sunbeam.	Sirup, Maple Sap.	Austin-Nichols Co., New York, N. Y.	C. B. Keech & Co., Tarboro..
13421	Sirup, Cane, Maple Flavor, Hudson.	Sirup, Compound, Table.	.....do.....	Perry Grocery Co., Durham..
13405	Sirup, Maple Sap, Pure, Sunbeam.	Sirup, Maple.	.....do.....	Pickett Bros., Lexington....
12258	Sirup, Maple Sap, Pride of Ohio.	Sirup, Maple Sap.	C. A. Crane, Warren, Ohio...	J. M. Tisdale, Burlington....
13426	Sirup, Cane and Maple Sugar, Vermont.	Sirup.....	Crystal Conserve Co., New York, N. Y.	C. A. Jones, Winston-Salem..
13407	Sirup, Maple Sap, Blue Label.	Sirup, Maple.	Curtice Bros. & Co., Rochester, N. Y.	Peedin & Peterson, Smithfield.
13428	Sirup, Table, Cane and Maple, Hirsch's.	Sirup, Cane and Maple.	Hirsch Bros. & Co., Louisville, Ky.	Carper Grocery Co., Greenville.
13416	Sirup, Table, Cane and Maple, Hirsch's Goodies	Sirup, Compound.	.....do.....	R. C. Brown, Tarboro.....
13425	Sirup, Cane and Maple, Wayne County.	Sirup, Cane and Maple.	The Horton-Cato Mfg. Co., Detroit, Mich.	W. T. Sockwell, Greensboro..
13419	Sirup, Table, Our Pride, Colored.	Sirup, Table..	Gast-Crofts Co., Louisville, Ky.	Sizemore Bros., Oxford.....
13412	Sirup, Nabob Pancake.	Sirup.....	Francis H. Leggett & Co., New York, N. Y.	Lackey Bros., Hamlet.....
13413	Sirup, Maple, Pure Sap, Premier.	Sirup, Maple.	.....do.....	J. H. Monger, Sanford.....
13409	Sirup, Maple, Vermont.	.....do.....	C. M. Tice & Co., Boston, Mass.	W. J. Byrd, Fayetteville....
12715	Sirup, Pure Cane and Maple Sugar, Towles' Log Cabin.	Sirup.....	The Towles Maple Product Co., St. Johnsbury, Vt.	Spencer & Co., Kinston.....
13408	Sirup, Pure Cane and Maple, Towles' Log Cabin.	Sirup Compound.	.....do.....	.....
13424	Sirup, Cane and Maple, Towles' Red Mill.	.....do.....	.....do.....	A. & P. Tea Co., Greensboro..
13422	Sirup, Maple, Our Pride Brand.	Sirup, Maple.	.....	E. M. Townes, Reidsville....
12706	Sirup, Scudder's Pure Cane and Pure Maple.	Sirup.....	Scudder Sirup Co., Chicago, Ill.	F. E. Barnes, Goldsboro.....
13410	Sirup, Scudder's Pure Cane and Maple.	.....do.....	.....do.....	A. S. Melvin, Fayetteville...
13411	Sirup, Pure Maple Sap, Bunny Brand.	Sirup, Maple.	.....do.....	M. A. Bethune, Fayetteville..

consumer. Products thus labeled are regarded by the Department as misbranded, for if any purchaser is misled thereby its sale is illegal. A label must tell the truth, the whole truth, and nothing but the truth.

See the results below.

## SIRUPS AND COMPOUND MAPLE SIRUPS.

Laboratory Number.	Total Solids—Per Cent.	Total Ash—Per Cent.	Insoluble Ash—Per Cent.	Soluble Ash—Per Cent.	Polarization, Direct, 20° C. °V.	Polarization, Invert, 20° C. °V.	Sucrose (Clerget), Per Cent.	Glucose, Per Ct. (Leach's) Formula.	Lead Number.	Alk. of Sol. Ash, CC $\frac{N}{10}$ HCl.	Water, Per Cent.	Remarks and Conclusions.
13423	67.90	.14	.05	.09	57.00	—22.00	59.50	0.00	.09	19.40	32.10	Cane sirup, containing maple sirup; should be labeled cane sirup, maple flavor.
13417	67.00	.55	.24	.31	+58.00	—20.90	59.40	0.00	1.36	39.40	33.00	Maple sirup.
13421	68.30	.06	.02	.04	+65.00	—22.00	65.50	0.00	.34	9.50	31.70	Cane sirup, containing maple sirup.
13405	66.10	.58	.23	.35	60.00	—22.00	61.80	0.00	1.44	-----	33.90	Maple sirup.
12258	67.70	.53	.21	.32	13.00	—20.00	24.80	0.00	1.19	36.60	32.30	Maple sirup; amount of sucrose small.
13426	66.10	.18	.07	.11	55.00	—20.90	57.20	0.00	.65	19.90	33.90	Cane and maple sirup.
13407	68.60	.55	.17	.38	60.00	—22.00	61.80	0.00	1.27	-----	31.40	Maple sirup.
13428	70.20	.58	.20	.38	50.00	—20.90	53.40	0.00	.58	32.40	29.80	Cane and maple sirup.
13416	69.00	.53	.10	.40	54.00	—20.90	56.40	0.00	.65	28.50	31.00	do.
13425	66.40	.12	.07	.05	62.00	—20.90	62.50	0.00	.39	9.90	33.60	Cane sirup, containing maple sirup.
13419	67.60	.37	.05	.32	47.00	—20.90	51.20	0.00	.65	32.90	32.40	Cane and maple sirup.
13412	66.40	.21	.05	.16	46.00	—22.00	51.30	0.00	.18	-----	33.60	do.
13413	67.20	.60	.25	.35	61.00	—22.00	62.60	0.00	1.32	-----	32.80	Maple sirup.
13409	67.00	.48	.19	.29	56.00	—22.00	58.80	0.00	1.20	-----	33.00	do.
12715	66.40	.11	.04	.07	57.60	—20.90	59.20	0.00	.17	15.70	33.60	Cane sirup, containing maple sirup.
13408	67.40	.12	.04	.08	62.00	—22.00	63.30	0.00	.13	-----	32.60	do.
13424	66.40	.08	.02	.06	33.00	—22.00	41.40	0.00	.15	9.80	33.60	do.
13422	60.90	.60	.05	.55	40.00	00.00	30.10	5.70	.60	40.20	39.10	Compound sirup, containing maple sirup.
12706	68.70	.24	.11	.13	34.00	—22.00	42.20	0.00	.39	18.70	31.30	Cane sirup, containing maple sirup.
13410	70.20	.18	.05	.13	58.00	—22.00	60.30	0.00	.27	-----	29.80	Cane and maple sirup; cane sirup being much in excess.
13411	67.70	.60	.18	.42	58.00	—22.00	60.30	0.00	1.48	-----	32.30	Maple sirup.

## RESULTS OF THE EXAMINATION OF MAPLE

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13418	Sirup, Pure Maple Sap, Crane's Twin Stars.	Sirup, Maple.	Scudder-Crane Co., Warren, Ohio.	Cannady & Alston, Oxford...
13427	Sirup, Maple Sap, Scudder's Canada.	.....do.....	Scudder's Sirup Co., Chicago, Ill.	J. A. Hauchins & Co., Winston-Salem.
13420	Sirup, Maple, Ferndell Brand.	.....do.....	Sprague-Warner Co., Chicago, Ill.	Patterson Bros. & Co., Durham.
13414	Sirup, Maple Sap, Green Mountain Boy.	.....do.....	Welch Bros. Maple Sirup Co., Burlington, Vt.	Barnes-Graves Grocery Co., Wilson.
13415	Sirup, Breakfast, Cane and Maple, Robin Hood Brand.	Sirup, Breakfast.	R. C. Williams & Co., New York, N. Y.	F. Y. Arrington, Rocky Mount.
13406	Sirup, Genuine Maple Sap, Royal Scarlet Brand.	Sirup, Maple.	.....do.....	L. E. Monroe & Son, Laurinburg.

## MILK AND CREAM.

## DEFINITIONS AND STANDARDS.

Milk is the fresh, clean, lacteal secretion obtained by the complete milking of one or more healthy cows properly fed and kept, excluding that obtained within fifteen days before and ten days after calving, and contains not less than eight and one-half (8.5) per cent of solids not fat, and not less than three and one-quarter (3.25) per cent of milk fat.

Blended milk is milk modified in its composition so as to have a definite and stated percentage of one or more of its constituents.

Skim-milk is milk from which a part or all of the cream has been removed, and contains not less than nine and one-quarter (9.25) per cent of milk solids.

Cream is that portion of milk, rich in milk fat, which rises to the surface of milk on standing, or is separated from it by centrifugal force, is fresh and clean, and contains not less than eighteen (18) per cent of milk fat.

## RESULTS OF THE EXAMINA

Laboratory Number	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13637	.....	Milk.	Adams, Judge S. B., Greensboro, N. C.	Greensboro Drug Co., Greensboro.
13161	.....	.....do.....	.....	James A. Anderson, Watha.....
13760	.....	.....do.....	Arnold Bros., New Bern, N. C.	Busy Bee Café, New Bern.....
13757	.....	.....do.....	.....do.....	F. S. Duffy, New Bern.....

## SIRUPS AND COMPOUND MAPLE SIRUPS—Continued.

Laboratory Number.	Total Solids—Per Cent.	Total Ash—Per Cent.	Insoluble Ash—Per Cent.	Soluble Ash—Per Cent.	Polarization, Invert, 20° C. %V.	Polarization, Invert, 20° C. %V.	Sucrose (Clerget), Per Cent.	Glucose, Per Ct. (Leach's) Formula.	Lead Number.	Alk. of Sol. Ash, CC. N. HCl. 10	Water, Per Cent.	Remarks and Conclusions.
13418	65.90	.59	.21	.38	49.00	—20.90	52.60	0.00	1.53	47.80	34.10	Maple sirup.
13427	63.00	.45	.16	.29	52.00	—20.90	54.90	0.00	1.29	42.00	37.00	do.
13420	66.10	.49	.13	.36	58.00	—22.00	60.30	0.00	1.10	38.60	33.90	do.
13414	67.60	.50	.21	.29	59.00	—22.00	61.00	0.00	1.21	-----	32.40	do.
13415	67.00	.13	.03	.10	64.00	—22.00	64.40	0.00	.29	9.60	33.00	Cane sirup, containing maple sirup.
13406	67.40	.49	.14	.35	58.00	—22.00	60.30	0.00	1.24	-----	32.60	Maple sirup.

Under the head of milk and cream 103 samples of milk and 7 samples of cream have been examined. Of the 103 samples of milk, 25 were below standard, and of the 7 samples of cream 1 was slightly below standard.

The Food Law provides that a food product shall be deemed to be adulterated—

If any substance has been mixed or packed with it so as to reduce or lower or injuriously affect its quality or strength;

If its strength or purity falls below the standards that have been adopted by the Board of Agriculture.

The results of the examination indicate that water had been added to the milk, which reduced and lowered its quality or strength. The addition of water to milk makes the sale of same illegal, and the fact that 25 of the samples examined were below standard made their sale illegal.

See results in table below.

## TION OF MILK AND CREAM.

Laboratory Number.	Fat, Butter—Per Cent.	Solids—Per Ct.	Reading Refractometer on Fat, 40° C.	Refractive Index of Fat.	Remarks and Conclusions.
13637	3.60	12.90	44.2	1.4553	Milk.
13161	5.20	13.60	45.0	1.4558	do.
13760	3.80	10.60	44.2	1.4553	do.
13757	3.40	12.90	44.2	1.4553	do.

## RESULTS OF THE EXAMINA

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13753	Milk		Arthur, S. A., Morehead City, N. C.	Morehead City Drug Co., Morehead City.
13754	do	do	do	R. E. Lee, Morehead City
12752	do		Baker, J. R., Morehead City, N. C.	Chalk's Pharmacy, Morehead City.
13578	do		do	W. G. Baptist, Wendell
13782	do		Battley, T. E., Hamlet, N. C.	Hamlet Candy Kitchen, Hamlet
13781	do	do	do	Hamlet Pharmacy, Hamlet
13783	do	do	do	Athens Café, Hamlet
13784	do	do	do	Fox Drug Co., Hamlet
13806	do		Beatty, T. J., Mount Holly, N. C.	Brown's Café, Charlotte
13743	do		Bell, A. L., Goldsboro, N. C.	Royal Fruit Store, Goldsboro
13635	do		Belmont Dairy, Greensboro, N. C.	Johnson's Café, Greensboro
13673	Cream		Bernhardt, G. M., Salisbury, N. C.	J. W. McPherson, Salisbury
13809	Milk		Berryhill, J. O., Charlotte, N. C.	Bowen's Drug Store, Charlotte
13803	do	do	do	Brannon-Hahn Co., Charlotte
13805	do	do	do	Brown's Café, Charlotte
13795	do	do	do	Hospital Supply and Drug Co., Charlotte.
13802	do	do	do	Moody's Drug Store, Charlotte
13763	Cream		Biltmore Farms, Biltmore, N. C.	Bradham's Broad Street Store, New Bern.
13728	Biltmore Dairy Milk	Milk	Biltmore Creamery, Asheville, N. C.	Teague & Ashe, Asheville
13818	do	do	Blanton, W. H., Shelby, N. C.	Sloop Drug Co., Shelby
12961	do	do	do	Mrs. Lucy G. Boyd, Reidsville
13998	do	do	do	Brame Drug Co., North Wilkesboro.
13761	do	do	Bray, F. L.	Clark's Cigar Store, New Bern
13767	do	do	Brown, W. A., Rocky Mount, N. C.	Woodall & Shepherd, Wilmington
13827	do	do	Burrage's Dairy, Concord, N. C.	Piedmont Café, Concord
13825	do	do	do	Kondrows Co., Concord
14006	do	do	Byerly's Dairy	Fairview Drug Co., Winston-Salem.
13639	Milk		Clauda, W. F., & Sons, Greensboro, N. C.	Globe Café, Greensboro
13792	do		Cloverdale Dairy, Monroe, N. C.	N. D. Saleeby, Monroe
13602	do	do	do	John W. Covington, Rockingham
14148	do	do	do	E. C. Croft, Wilmington
13768	do	do	Croft, E. C., Wilmington, N. C.	Warren Candy Co., Wilmington
13770	do	do	Croft, E. C., Wilmington, N. C.	Mission Pharmacy, Wilmington
13808	do	do	Davis, R. S. & H. W., Charlotte, N. C.	Charlotte Drug Co., Charlotte
13777	Cream		Duniven & Plemmons, Lumberton, N. C.	McDonald Drug Co., Lumberton
13604	Milk		Edwards, Mrs. D. M., Raleigh, N. C.	New York Quick Lunch, Raleigh
13789	do	do	Ferndon Dairy, Wadesboro, N. C.	Parson's Drug Co., Wadesboro
13790	do	do	do	Fox & Lyon Drug Co., Wadesboro.
13791	do	do	do	Pee Dee Pharmacy, Wadesboro
13811	do	do	Gastonia Dairy, Gastonia, N. C.	Kennedy's Drug Store, Gastonia
13814	do	do	do	Piedmont News Co., Gastonia
13823	do	do	do	Gibson Drug Co., Concord
13769	do	do	Glenwood Dairy Farm, Wilmington, N. C.	Orton Confectionery, Wilmington.

TION OF MILK AND CREAM—*Continued.*

Laboratory Number.	Fat, Butter— Per Cent.	Solids.	Reading Refractometer on Fat, 40° C.	Refractive Index of Fat.	Remarks and Conclusions.
13753	4.80	14.50	44.2	1.4553	Milk.
13754	3.50	12.10	44.2	1.4553	do.
13752	4.00	12.90	44.2	1.4553	do.
13578	4.74	12.48	-----	-----	do.
13782	1.60	10.60	44.2	1.4553	Milk, below standard; adulterated; sale illegal.
13781	4.20	13.20	44.2	1.4553	Milk.
13783	3.40	12.10	44.2	1.4553	do.
13784	4.40	13.50	44.2	1.4553	do.
13806	4.40	13.50	44.2	1.4553	do.
13743	4.40	14.10	44.2	1.4553	do.
13635	3.40	11.60	44.2	1.4553	do.
13673	17.50	24.80	45.0	1.4559	Cream, below standard; adulterated; sale illegal.
13809	4.20	12.50	44.2	1.4553	Milk.
13803	4.20	12.60	44.2	1.4553	do.
13805	3.80	12.50	44.2	1.4553	do.
13798	4.00	13.00	44.2	1.4553	do.
13802	5.00	13.60	44.2	1.4553	do.
13763	26.30	31.40	44.2	1.4553	Cream.
13728	5.00	14.30	44.2	1.4553	Milk.
13818	2.00	10.90	44.2	1.4553	Milk, below standard; adulterated; sale illegal.
12961	5.60	14.40	50.0	1.4593	Milk.
13998	4.30	13.20	-----	-----	do.
13761	4.80	13.40	44.2	1.4553	do.
13767	3.80	12.20	44.2	1.4553	do.
13827	4.20	13.10	-----	-----	do.
13825	4.20	13.00	44.2	1.4553	do.
14006	1.20	9.30	-----	-----	Milk, below standard; adulterated; sale illegal.
13639	2.00	11.10	44.2	1.4553	do.
13792	7.40	15.10	44.2	1.4553	Milk.
13602	6.40	-----	-----	-----	-----
14148	5.80	15.07	44.0	1.4552	do.
13768	3.80	12.60	44.2	1.4553	do.
13770	4.40	13.70	44.2	1.4553	do.
13808	4.20	-----	44.2	1.4553	do.
13777	24.90	31.50	44.2	1.4553	Cream.
13604	5.60	12.70	44.2	1.4553	Milk.
13789	3.60	12.90	44.2	1.4553	do.
13790	5.00	14.10	44.2	1.4553	do.
13791	3.40	12.70	44.2	1.4553	do.
13811	4.20	12.90	46.0	1.4566	do.
13814	4.40	13.20	46.0	1.4566	do.
13823	3.00	12.40	44.2	1.4553	Milk, below standard in fat; sale illegal.
13769	2.00	11.30	44.2	1.4553	Milk, below standard; adulterated; sale illegal.

## RESULTS OF THE EXAMINA

Laboratory Number	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13766	Milk		Glenwood Dairy Farm, Wilmington, N. C.	Olympic Café, Wilmington
13804	Cream		Hahn, J. W., Charlotte, N. C.	Brannon-Hahn Co., Charlotte
14007	Milk		Halliman, Winston-Salem, N. C.	Grimes Mills Drug Co., Winston-Salem.
13747	do		Hadley, R. F., LaGrange, N. C.	Floyd Barwick, LaGrange
14004	do			J. A. Hauchins, Winston-Salem
13608	do		Harden, John W., Raleigh, N. C.	Giersch's Café, Raleigh
13794	do		Helms, Charles, Monroe, N. C.	H. J. Hinson, Monroe
13796	do		do	Union Drug Co., Monroe
13636	do		Johnson, Burt, Greensboro, N. C.	Greensboro Café, Greensboro
13999	do		Jones' Dairy, Winston-Salem, N. C.	Welfare's Drug Store, Winston-Salem.
13765	do		Kidd, H. L., Wilmington, N. C.	J. Hicks Bunting, Wilmington
13772	do		do	William H. Green Co., Wilmington.
13786	do		Leach, Clarence, Laurinburg, N. C.	Noah Fields, Laurinburg
13785	do		do	J. T. Fields, Laurinburg
13815	do		Leonard, J. A., Lincolnton, N. C.	J. A. Leonard, Lincolnton
13787	do		Maplewood Dairy, Rockingham, N. C.	Fox's Drug Store, Rockingham
13788	do		do	Biggs Drug Co., Rockingham
13774	do		Martindale, O., Wilmington, N. C.	South Side Confectionery, Wilmington.
13692	do		McComb's, D., Dairy, Hickory, N. C.	Moser & Lutz, Hickory
13717	do		Morgan, J. L., Marion, N. C.	The Davis Pharmacy, Marion
14241	do		do	J. B. Outlaw, Middlesex
	Human.			
13995	Milk		Nowell, Mrs. J. R., Reidsville, N. C.	J. R. Newman, Reidsville
13780	do		Oak Cross Dairy, Maxton, N. C.	Dixie Café, Maxton
13779	do		do	Barnes Bros. Drug Co., Maxton
13778	do		do	Robeson Drug Co., Maxton
14001	do		Owens Drug Co., Winston-Salem, N. C.	Owens Drug Co., Winston-Salem
13775	do		Page Drug Co., Lumberton, N. C.	Page Drug Co., Lumberton
13795	do		Park, Lee, Dairy, Monroe, N. C.	The Arch Café, Monroe
13759	do		Pate, Will, New Bern, N. C.	Wood-Lane Drug Co., New Bern
13828	do		Patterson, Lewis, Concord, N. C.	Piedmont Café, Concord
14002	do		do	Polites Candy Kitchen, Winston-Salem.
13758	do		Pembroke Dairy, New Bern, N. C.	Wood-Lane Drug Co., New Bern
13997	do		do	Peoples Drug Co., Elkin
13641	do		do	E. W. Robinson, LaGrange
13666	Cream		Red Crest Farm, Elmwood, N. C.	High Point Candy Co., High Point.
13603	Milk		do	Royal Café and Lunch Room, Raleigh.
13812	do		Rhyne, M. A., Gastonia, N. C.	Morris' Café, Gastonia
13813	do		do	Adams Drug Co., Gastonia
13755	do		Russell, Mrs., Beaufort, N. C.	Beaufort Drug Co., Beaufort
13824	do		Sappenfield, C. M., Concord, N. C.	Sappenfield's Drug Store, Concord.
13606	do		Sasser, Ben, Raleigh, N. C.	Bland Lunch Room, Raleigh
13921	do		Sasser, A. L., Goldsboro, N. C.	Palace Drug Store, Goldsboro
13742	do		do	Cook Drug Co., Goldsboro
13826	do		Scott's Dairy, Concord, N. C.	Marsh Drug Co., Concord

TION OF MILK AND CREAM—*Continued.*

Laboratory Number.	Fat, Butter— Per Cent.	Solids.	Reading Refractometer on Fat, 40° C.	Refractive Index of Fat.	Remarks and Conclusions.
13766	3.60	12.40	44.2	1.4553	Milk.
13804	22.70	30.00	45.0	1.4559	Cream.
14007	5.20	14.60	-----	-----	Milk.
13747	3.80	13.60	44.2	1.4553	do.
14004	1.80	10.80	-----	-----	Milk, below standard; adulterated; sale illegal.
13608	6.00	15.40	44.2	1.4553	Milk.
13794	4.00	11.10	44.2	1.4553	Milk, slightly below standard.
13796	2.00	10.50	44.2	1.4553	Milk, below standard; adulterated; sale illegal.
13636	3.00	13.20	44.2	1.4553	Milk, below standard in milk fat; adulterated; sale illegal.
13999	3.50	12.10	-----	-----	Milk.
13765	2.00	10.40	44.2	1.4553	Milk, below standard; adulterated; sale illegal.
13772	3.80	12.20	44.2	1.4553	Milk.
13786	3.80	11.60	44.2	1.4553	do.
13785	3.60	11.90	44.2	1.4553	do.
13815	5.60	14.10	44.2	1.4553	do.
13787	3.00	11.60	44.2	1.4553	Milk, below standard; adulterated; sale illegal.
13788	3.00	11.90	44.2	1.4553	do.
13774	2.80	11.70	44.2	1.4553	do.
13692	5.70	13.20	45.0	1.4559	Milk.
13717	2.50	11.80	44.2	1.4553	Milk, below standard in milk fat; adulterated; sale illegal.
14241	2.98	10.69	-----	-----	Milk, low in fat and total solid matter.
13995	3.80	10.70	-----	-----	Milk, below standard; adulterated; sale illegal.
13780	4.40	13.30	44.2	1.4553	Milk.
13779	5.70	14.40	44.2	1.4553	do.
13778	4.40	13.70	44.2	1.4553	do.
14001	3.00	12.00	-----	-----	do.
13775	5.10	13.90	44.2	1.4553	do.
13795	5.80	14.30	44.2	1.4553	do.
13759	4.60	13.20	44.2	1.4553	do.
13828	4.40	13.60	-----	-----	do.
14002	4.50	12.30	-----	-----	do.
13758	2.50	10.20	44.2	1.4553	Milk, below standard; adulterated; sale illegal.
13997	1.50	9.07	-----	-----	do.
13641	6.00	-----	52.5	1.4610	Milk.
13666	19.00	26.60	45.0	1.4559	Cream.
13603	6.00	13.80	44.2	1.4553	Milk.
13812	6.00	14.80	44.2	1.4553	do.
13813	5.80	15.40	44.2	1.4553	do.
13755	3.40	11.80	44.2	1.4553	do.
13824	4.20	12.50	44.2	1.4553	do.
13606	4.40	13.10	44.2	1.4553	do.
13921	4.80	12.90	44.2	1.4553	do.
13742	4.80	12.90	44.2	1.4553	do.
13826	4.80	14.30	-----	-----	do.

## RESULTS OF THE EXAMINA

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
14000	-----	Milk-----	-----	Shaffner & Landquest, Winston-Salem.
13607	-----	do-----	Smith, W. W., Raleigh, N. C.-----	White's Café, Raleigh-----
13773	-----	do-----	Spencer, Dairyman, Wilmington, N. C.-----	South Side Drug Co., Wilmington.
13762	-----	do-----	Stevenson, J. H., New Bern, N. C.-----	Bradham's Broad Street Store, New Bern.
13764	-----	Cream-----	do-----	do-----
14005	-----	Milk-----	-----	The Sweet Shop, Winston-Salem.
13669	-----	do-----	Thackey Dairy, High Point, N. C.-----	New York Café, High Point-----
13638	-----	do-----	Thompson, J. A., Greensboro, N. C.-----	Still Drug Co., Greensboro-----
13996	-----	do-----	Tucker, Mrs. R. H., Reidsville, N. C.-----	R. H. Tucker, Reidsville-----
13750	-----	do-----	Tull, George W., Kinston, N. C.-----	J. E. Hood & Co., Kinston-----
13751	-----	do-----	do-----	E. B. Marston Drug Co., Kinston.
14003	-----	do-----	-----	Thompson's Drug Store, Winston-Salem.
13605	-----	do-----	Walters, B. N., Raleigh, N. C.-----	Wright's Café, Raleigh-----
13771	-----	do-----	Warren, A. G., Ice-cream Co., Wilmington, N. C.-----	Neely Café, Wilmington-----
13713	-----	Cream-----	White Pine Creamery, Asheville, N. C.-----	Allison's Drug Store, Asheville...
13726	-----	Milk-----	do-----	do-----
13727	-----	do-----	do-----	Eureka Café, Asheville-----
13807	-----	do-----	Williams, P. H., Dairy, Charlotte, N. C.-----	W. L. Hand & Co., Charlotte-----
13776	-----	do-----	Woodlawn Dairy, Lumberton, N. C.-----	McMillan's Pharmacy, Lumberton.

TION OF MILK AND CREAM—*Continued.*

Laboratory Number.	Fat, Butter— Per Cent.	Solids.	Reading Refractometer on Fat, 40° C.	Refractive Index of Fat.	Remarks and Conclusions.
14000	2.90	11.50	-----	-----	Milk, below standard; adulterated; sale illegal.
13607	4.40	12.70	44.2	1.4553	Milk.
13773	5.40	14.10	44.2	1.4553	do.
13762	5.60	14.50	44.2	1.4553	do.
13764	27.40	33.00	44.2	1.4553	Cream.
14005	2.80	11.50	-----	-----	Milk, below standard; adulterated; sale illegal.
13669	6.20	14.90	44.2	1.4553	Milk.
13638	4.20	10.90	44.2	1.4553	Milk, below standard in total solids; adulterated; sale illegal.
13996	3.60	12.60	-----	-----	Milk.
13750	4.40	14.00	44.2	1.4553	do.
13751	4.00	13.00	44.2	1.4553	do.
14003	3.60	12.30	-----	-----	do.
13605	3.40	10.40	44.2	1.4553	Milk, below standard; adulterated; sale illegal.
13771	5.40	14.30	44.2	1.4553	Milk.
13713	30.70	36.80	45.0	1.4559	Cream.
13726	2.70	10.60	44.2	1.4553	Milk, below standard; adulterated; sale illegal.
13727	2.20	10.90	44.2	1.4553	do.
13807	3.80	12.00	44.2	1.4553	Milk.
13776	3.80	11.70	44.2	1.4553	do.

## CONDENSED MILK.

## DEFINITIONS AND STANDARDS.

*Condensed milk, evaporated milk*, is milk from which a considerable portion of water has been evaporated, and contains not less than 28 per cent of milk solids, of which not less than 27.5 per cent is milk fat.

*Sweetened condensed milk* is milk from which a considerable portion of water has been evaporated and to which sugar (sucrose) has been

## RESULTS OF THE EXAMINATION

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.
14273	Columbian Brand, Evaporated Cream, Unsweetened.....	Borden's Condensed Milk Co., New York, N. Y.
14263	Borden's Columbian Evaporated Milk.....	do.....
14261	Borden's Columbian Brand, Unsweetened.....	do.....
14256	Borden's Peerless, Unsweetened, Sterilized Evaporated Milk.....	do.....
14248	Evaporated Milk, Pilgrim Brand, Sterilized, Unsweetened.....	Continental Condensed Milk Co., Mill Hall, Pa.
14252	do.....	do.....
14277	Our Pet Brand, Evaporated Milk, Unsweetened.....	Helvetia Condensing Milk Co., Highland, Ill.
14268	do.....	do.....
14264	do.....	do.....
14258	Hire's Gold Brand, Sterilized, Unsweetened, Evaporated Milk.....	Hire's Condensed Milk Co., Philadelphia, Pa.
14246	Condensed Milk, Gold Brand.....	do.....
14250	Evaporated Milk, Gold Brand, Sterilized, Full Cream.....	do.....
14251	Evaporated Skimmed Milk, Sunrise Brand.....	do.....
14253	do.....	do.....
14254	Evaporated Milk, Full Cream, Sterilized, Gold Brand.....	do.....
14271	Wilson's Evaporated Milk, Contains not less than 23% Solids and 7.80% Butter Fat.....	Indian Condensed Milk Co., Sheridan, Ind.
14267	Evaporated Milk, Libby's Unsweetened.....	Libby, McNeill & Libby, Chicago, Ill.
14255	Evaporated Milk, Libby's Sterilized, Unsweetened.....	do.....
14272	Evaporated Milk, Unsweetened, Gold Cross Brand.....	Mohawk Condensed Milk Co., Rochester, N. Y.
14274	Evaporated Milk, Sharpless Acorn Brand, Unsweetened.....	P. E. Sharpless Co., Philadelphia, Pa.
14276	Evaporated Milk, Van Camp's, Unsweetened.....	Van Camp Packing Co., Indianapolis, Ind.
14275	Evaporated Milk, Van Camp's Unsweetened, Uncolored, Sterilized.....	do.....
14266	Evaporated Milk, Van Camp's, Uncolored, Unsweetened.....	do.....
14245	Evaporated Milk, Van Camp's, Sterilized, Uncolored, Unsweetened.....	do.....
14247	Evaporated Milk, Van Camp's.....	do.....
14257	Evaporated Milk, Unsweetened, Every Day Brand.....	John Wildi Evaporated Milk Co., Columbus, Ohio.
14269	do.....	do.....
14260	Evaporated Milk, Every Day Brand, Unsweetened, Sterilized.....	John Wildi Evaporated Milk Co., Highland, Ill.
14262	Evaporated Milk, Royal Scarlet Brand.....	R. C. Williams & Co., New York, N. Y.

added, and contains not less than 28 per cent of milk solids, of which not less than 27.5 per cent is milk fat.

*Condensed skim-milk* is skim-milk from which a considerable portion of water has been evaporated.

Because of the condition of the standard, the results of the examination of 29 samples of unsweetened condensed milk, and condensed skim-milk are presented without comment in the table below.

These results can be used in comparing the quality or richness of brands represented.

## OF CONDENSED MILK.

Laboratory Number.	Retail Dealer or Party Who Sent Sample for Analysis.	Fat, Butter, Per Cent.	Solid Matter, Per Cent.	Per Cent of Fat in Solids.	Protein—Per Cent.
14273	O. H. Walker, Winston-Salem .....	8.10	29.87	27.30	7.40
14263	Eagle Grocery, Elizabeth City .....	7.35	26.04	28.40	6.44
14264	T. J. Raynor, Elizabeth City .....	6.90	25.83	26.70	6.44
14256	E. B. Hackburn, New Bern, N. C. ....	7.50	28.37	26.10	7.53
14248	J. B. Sawyer, Morehead City .....	7.20	25.37	28.50	5.87
14252	B. B. Davenport, New Bern .....	6.90	25.44	27.10	6.25
14277	S. H. Youngblood, Charlotte .....	8.25	26.36	31.50	7.08
14268	J. H. Riley, Wilson .....	7.80	26.12	30.10	6.64
14264	J. Broughton & Bros., Hertford .....	8.40	30.25	27.90	7.98
14258	Walter Credle Co., Washington .....	6.45	26.06	25.00	7.08
14246	M. L. McRae, Maxton .....	7.05	25.89	27.30	6.64
14250	J. D. Phillips, Morehead City .....	6.60	24.83	26.80	6.25
14251	J. B. Morton, Morehead City .....	0.00	20.45	00.00	7.20
14253	Lucas & Lewis, New Bern .....	0.00	20.26	00.00	6.83
14254	do .....	6.75	25.81	26.40	6.51
14271	J. A. Isley & Bro. Co., Burlington .....	7.50	25.18	29.90	6.38
14267	Peedin & Peterson, Smithfield .....	7.50	25.50	29.50	6.51
14255	H. C. Armstrong, New Bern .....	6.60	26.11	25.30	6.83
14272	J. R. Chrisman & Bro., Greensboro .....	7.35	25.31	29.10	6.44
14274	D. H. Ray, Fayetteville .....	7.20	25.07	28.70	6.70
14276	Smith Grocery Co., Lexington .....	6.75	27.03	25.20	7.34
14275	Lopp Bros., Lexington .....	7.50	27.49	27.40	7.15
14266	Davis & Son, Plymouth .....	7.20	25.65	28.10	6.64
14245	M. W. Pope, Mount Olive .....	7.05	26.81	26.30	6.76
14247	J. T. Pinkston & Son, Wadesboro .....	7.80	27.32	28.50	6.51
14257	Joseph F. Taylor, Washington .....	7.05	26.33	26.80	7.40
14269	Shearin & Parham, Rocky Mount .....	6.90	26.17	26.50	6.83
14260	W. H. Cartwright & Son, Elizabeth City .....	7.50	26.73	28.60	6.64
14262	Eagle Grocery Co., Elizabeth City .....	8.10	25.81	31.40	7.21

## MISCELLANEOUS SAMPLES.

Samples, 20 in number, sent to the Department for analysis, being only a few of each kind, are grouped under the head of "Miscellaneous

## RESULTS OF THE EXAMINATION

Laboratory Number.	Material.	Manufacturer or Wholesaler.
13065	Meat.....	J. B. Allen, Henderson, N. C.....
12964	Sausage Meat.....	.....
13056	Egg Flip.....	J. C. Brantley, Raleigh, N. C.....
13687	Ginger.....	Clotworthy Chemical Co., Baltimore, Md.....
12651	Sugar.....	.....
12802	Salt.....	.....
13950	Baking Powder.....	R. B. Davis Co., Hoboken, N. J.....
12066	Salt.....	.....
9818	Whiskey.....	Green River Distilling Co.....
12534	Capudine.....	H. T. Hicks, Raleigh, N. C.....
12890	Salt.....	.....
13057	Egg Flip.....	King-Crowell Drug Co., Raleigh, N. C.....
13736	Blackberry Wine.....	.....
14141	Fruit Powders.....	Norman-Perry Drug Co., Winston-Salem, N. C.....
14140	.....do.....	.....do.....
12963	Souse Meat.....	.....
14142	Fruit Powder.....	Vaughn-Crutchfield Co., Winston-Salem, N. C.....
13055	Egg Flip.....	The Wake Drug Store, Raleigh, N. C.....
13286	Ginger Ale.....	Wurzbarger Ginger Ale Co., Portsmouth, Va.....
13061	.....do.....	.....do.....

## MOLASSES AND SIRUPS.

## DEFINITIONS AND STANDARDS.

Sirup is the sound product made by purifying and evaporating the juice of a sugar-producing plant without removing any of the sugar.

Sugar-cane sirup is sirup made by the evaporation of the juice of the sugar-cane, or by the solution of sugar-cane concrete.

Sorghum sirup is sirup made by the evaporation of sorghum juice or by the solution of sorghum concrete.

Refiners' sirup is the residual liquid product obtained in the process of refining raw sugar.

Molasses is the product after separating the sugar from massecuite, melada, mush sugar, or concrete.

Molasses or sirup that is compounded or mixed with glucose or any other substance to cheapen or lower its quality must be labeled so as to plainly indicate what the product is. That is, a mixture of molasses and corn sirup, with the molasses in excess, would be properly labeled molasses and corn sirup. If the corn sirup is in excess, it should be labeled

Samples," and the conclusions drawn from the results of the analyses are published in the table below.

## OF MISCELLANEOUS SAMPLES.

Laboratory Number.	Retail Dealer or Party Who Sent Sample for Analysis.	Remarks and Conclusions.
13065	J. B. Allen, Henderson, R. F. D. ....	Meat, ham, in bad condition; sale illegal.
12964	Mrs. I. J. Arden, Black Mountain. ....	Meat, sausage, contained starch.
13056	B. F. Dixon, Raleigh. ....	Egg flip, alcohol (by volume), .65%.
13687	M. W. Nash, Hamlet. ....	Extract of ginger; misbranded; sale illegal.
12651	Dr. L. A. Crowell, Lincolnton. ....	Sugar, in which a little bluing was left in the manufacture.
12802	C. P. Davis, Colerain. ....	Common salt; little impurity.
13950	John Lewis, Southern Pines. ....	Baking powder, phosphate; low in carbon dioxide gas.
12066	J. W. Draper, Caraway. ....	Common salt, small amount of magnesium chloride.
9818	P. W. Glidewell, Reidsville. ....	Straight whiskey; properly aged.
12534	H. T. Hicks, Raleigh. ....	Capudine; alcohol (by volume), 6.60%.
12890	T. E. Hilliard, Middlesex. ....	Common salt; no impurity.
13057	B. F. Dixon, Raleigh. ....	Egg flip; alcohol (by volume), 1.72%.
13736	M. W. Nash, Hamlet. ....	Intoxicating; sale illegal.
14141	C. C. Sanford Sons Co., Mocksville. ....	Salicylic acid; use in food deleterious to health.
14140	J. T. Angell, Mocksville. ....	do.
12963	W. C. Sutton, Kinston. ....	Souse meat; appeared to be all right.
14142	City Grocery Co., Madison. ....	Salicylic acid; use in food deleterious to health.
13155	B. F. Dixon, Raleigh. ....	Egg flip; alcohol (by volume), 2.92%.
13286	Capt. F. F. Brown, Raleigh. ....	Ginger ale; misbranded; sale illegal.
13061	F. L. Wallard, U. S. Inspector, Raleigh. ....	do.

corn sirup and molasses. Corn sirup containing a small amount of cane sirup should be labeled so as to plainly indicate the facts in the case. A label, "Corn and Cane Sirup," is not, in our judgment, a proper label for a product composed largely of corn sirup containing a small amount of cane sirup. A product so labeled should contain a material amount of the cane sirup.

Refiners' sirup is not cane sirup, and cannot be legally sold as such. Neither would a mixture of corn sirup and refiners' sirup be properly labeled if labeled corn and cane sirup. It should be labeled corn and refiners' sirup or compound sirup.

Molasses and sirups seem to be much adulterated and misbranded. Some manufacturers are disposed to hide the truth in regard to the real character of compound sirups, while others label them plainly what they are, as will be seen by reference to the table below; but the greater number of violations in the sale of this class of products are committed by the retail dealers. They buy the products in bulk, labeled compound or with the name of the ingredients on the label, showing that it is a compound, and then they proceed to sell it as a pure product. Some

of these products are labeled corn and cane sirup, which label would appear to indicate about equal parts of each ingredient, when as a fact it is corn sirup or glucose flavored with or containing a small amount of cane sirup. Manufacturers often use the term cane sirup when the product is not cane sirup, but is refiners' sirup instead. They also label some of these compound sirups "Table Sirup." If a product contains corn sirup, glucose, or any other substance except one made

## RESULTS OF THE EXAMINATION OF MOLASSES

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13142	Sirup, American Table.	Table Sirup	American Sirup and Preserving Co., Nashville, Tenn.	J. W. Williams, Reidsville..
12723	Molasses, Dove Brand.	Molasses	Alexander Molasses Co., Chicago, Ill.	C. D. Jones Co., Beaufort..
12981	Corn Sirup and Country Sorghum, Tenn. Br'd	Sirup	American Sirup and Preserving Co., Nashville, Tenn.	E. B. Liles, Rockingham...
12719		do	Angel & Hooper, New Bern, N. C.	E. A. Cherry, Morehead, City.
13075	Corn and Refiners' Sirup, Our Duchess.	Compound Sirup.	C. W. Antrim & Sons Co., Richmond, Va.	N. J. Bell, Fayetteville....
13157		Molasses	do	R. C. Poore, Mount Airy...
13066	L. Molasses	do	do	J. S. Barbour & Sons, Clayton.
13120		Sirup	do	Eugene Johnston, Littleton.
13111		do	do	Curtis-Pierson Co., Enfield.
13101		Molasses	do	O. O. Boykin, Tarboro.....
13098		do	do	H. S. Joyner, Rocky Mount
12713		do	do	Hardy Hill, Kinston.....
13137		Sirup		Apex Mule and Supply Co., Apex.
13159	Molasses, Porto Rico, Capitol.	Molasses	Atlas Specialty Co., Richmond, Va.	G. W. Miller Co., North Wilkesboro.
13154	Refined Sugar and Corn Sirup, Old Va. Waffle Sirup.	Sirup	do	Meadow Supply Co., Madison.
13097	Delicious Table Sirup.	Table Sirup	Atlas Preserving Co., Baltimore, Md.	Oppenheimer's, Rocky Mount.
12716		do	do	Spencer & Co., Kinston....
13087	Sugar Sirup, Sunbeam Fancy.	Sugar Sirup	Austin-Nichols Co., New York, N. Y.	The Home Store, Southern Pines.
12751		Sirup	do	T. E. White, Edenton.....
13110		do		J. L. Barnes, Enfield.....
12710		do		Floyd Barwick, LaGrange..
13090		Molasses		Bell & Etheridge, Wilson...
12722	Sirup, Compound, Davis, No. 6.	Sirup	Bentley, Shiver & Co., Baltimore, Md.	J. D. Phillips, Morehead City.
13128	Sirup and Molasses, Bell's Comp.	do	Blackburn, Morris & Co., New Orleans, La.	E. G. Davis & Son Co., Henderson.

from the juice of a sugar-producing plant without removing any of the sugar, it is not a pure, true sirup, and cannot be properly labeled table sirup. Such products must be sold as compound sirup, refiners' sirup, or corn sirup, as the case may be.

Dealers are again cautioned not to sell these compound products as pure products. Their sale is all right, provided they are sold for what they are, but they must not be sold as pure products.

#### AND SIRUPS AND SUBSTITUTES FOR SAME.

Laboratory Number.	Polarization, Direct, 20° C. °V.	Polarization, Invert, 20° C. °V.	Sucrose (Clerget)—Per Cent.	Glucose, Commercial (Leach's Formula)—Per Cent.	Solid Matter—Per Cent.	Water—Per Cent.	Remarks and Conclusions.
13142	126.0	113.3	9.50	66.50	76.80	23.20	Compound sirup; misbranded. Is not table sirup; sale illegal.
12723	129.0	17.6	35.10	0.00	77.20	22.80	Molasses.
12981	122.0	112.2	7.40	65.50	76.10	23.90	Compound corn sirup, containing small amount of cane sirup, and should be sold as such.
12719	120.0	106.3	10.30	60.90	-----	-----	Compound sirup, sold as sirup; misrepresented; sale illegal.
13075	111.0	96.8	10.70	57.30	73.20	26.80	Compound sirup.
13157	38.0	17.6	41.90	0.00	73.80	26.20	Molasses.
13066	28.0	15.4	32.70	0.00	75.90	24.10	do.
13120	131.0	119.9	8.30	70.10	74.80	25.20	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
13111	34.0	15.4	37.20	0.00	80.00	20.00	Sirup.
13101	44.0	17.6	46.40	0.00	75.20	24.80	do.
13098	42.0	17.6	44.90	0.00	74.90	25.10	Molasses.
12713	40.0	15.4	41.70	0.00	74.30	25.70	do.
13137	121.0	107.8	10.00	63.40	74.10	25.90	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
13159	28.0	17.6	34.30	0.00	75.10	24.90	Molasses.
13154	88.0	88.0	0.00	50.30	62.60	37.40	Compound sirup, branded sirup; misbranded; sale illegal.
13097	143.0	143.0	0.00	81.70	76.40	23.60	Compound sirup, branded table sirup; misbranded; sale illegal.
12716	152.0	151.8	0.00	86.80	77.00	23.00	Compound sirup, branded "Delicious Table Sirup"; misbranded; sale illegal.
13087	10.0	18.7	21.60	0.00	79.50	20.50	Refiners' sirup and sirup, branded "Fancy Sugar Sirup"; misbranded; sale illegal.
12751	32.0	15.4	35.70	0.00	77.00	23.00	Sirup.
13110	46.0	17.6	47.90	0.00	75.60	24.40	do.
12710	86.0	57.2	21.70	36.70	-----	-----	Compound sirup, sold as sirup; misrepresented; sale illegal.
13090	38.0	13.2	38.50	0.00	75.50	24.50	Molasses.
12722	106.0	84.7	16.00	51.40	77.70	22.30	Compound sirup, sold as sirup; misrepresented; sale illegal.
13128	52.0	19.8	24.20	15.80	77.70	22.30	Compound sirup and molasses, sold as sirup; misrepresented; sale illegal.

## RESULTS OF THE EXAMINATION OF MOLASSES

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
12757	-----	Molasses	Blackburn, Morris & Co., New Orleans, La.	J. B. Hopkins, Williamston.
12748	-----	do	do	W. S. Blanchard & Son, Hertford.
12739	-----	do	do	W. H. Bowen, Belhaven.
13116	-----	Sirup	do	R. M. Purnell, Weldon.
13118	-----	Molasses	do	Herbert Smith, Littleton.
12971	-----	do	do	F. L. Orr, Maxton.
12967	-----	Sirup, Georgia Cane.	do	C. H. Borneman, Wilmington.
13091	-----	Molasses	G. W. Boykin Co., Wilson, N. C.	Otis Winbourne, Wilson.
13112	-----	Sirup	do	M. C. Braswell, Battleboro.
12975	-----	do	Charles E. Brauer & Co., Richmond, Va.	D. J. McDuffie, Laurinburg.
13107	-----	do	do	J. B. Britt, Enfield.
13108	-----	Molasses	do	do
13158	Sirup, Table, Crystal White.	Sirup	Castleman-Blakemore Co., Louisville, Ky.	Allen & Ulrich, North Wilkesboro.
13139	Molasses, Chris-Win.	Molasses	Christian-Winfree Co., Richmond, Va.	J. A. Isley & Bro. Co., Burlington.
12989	Karo	Karo	Corn Products Refining Co., New York, N. Y.	W. H. Moffitt, Lexington.
13153	Mary Jane	Sirup, Table Compound.	do	Hill & Tilley, Winston-Salem.
12703	Karo	Karo Sirup	do	W. R. Thompson, Goldsboro.
12711	-----	Sirup	L. A. Cobb & Co., Kinston, N. C.	Stephen Caraway, Kinston.
12714	-----	do	do	Stroud Bros., Kinston.
12718	-----	do	do	Burwell Stroud, Kinston.
12974	-----	do	W. B. Cooper, Wilmington, N. C.	Z. Anthony, Laurinburg.
12758	-----	Molasses	C. C. Covington, Wilmington, N. C.	J. R. & J. G. Moye, Greenville.
12970	-----	Sirup	do	Curry-Patterson Co., Maxton.
12990	-----	Sirup, Porto Rico.	do	S. H. Youngblood, Charlotte.
13067	-----	Molasses	do	Ashley Horne & Son, Clayton.
13068	-----	do	do	Champion Bros., Clayton.
13070	-----	do	do	W. M. Sanders, Smithfield.
13078	-----	do	do	W. Z. Deans, Red Springs.
12700	-----	Sirup	Deans & Moye Co., Goldsboro, N. C.	G. E. Daniels, Goldsboro.
13141	Molasses, New Orleans, Duff's.	Molasses	P. Duff & Sons, Pittsburg, Pa.	Dixie Store Co., Graham.
13109	do	do	do	W. J. Burgess, Enfield.

AND SIRUPS AND SUBSTITUTES FOR SAME—*Continued.*

Laboratory Number.	Polarization, Direct, 20°C. °V.	Polarization, Invert, 20°C. °V.	Sucrose (Clerget)—Per Cent.	Glucose, Commercial (Leach's Formula)—Per Cent.	Solid Matter—Per Cent.	Water—Per Cent.	Remarks and Conclusions.
12757	42.0	17.6	44.90	0.00	76.40	23.60	Molasses.
12748	70.0	44.0	19.60	28.80	76.70	23.30	Compound molasses, sold as molasses; misrepresented; sale illegal.
12739	24.0	13.2	28.00	0.00	74.90	25.10	Molasses.
13116	104.0	80.3	17.80	49.20	75.90	24.10	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
13118	36.0	15.4	38.70	0.00	77.30	22.70	Molasses.
12971	36.0	15.4	38.74	0.00	78.10	21.90	do.
12967	54.6	21.3	57.96	0.00	70.00	30.00	Sirup.
13091	42.0	16.5	44.10	0.00	76.90	23.10	Molasses.
13112	80.0	48.4	23.80	32.10	76.50	23.50	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
12975	28.0	15.4	32.81	0.00	75.60	24.40	Sirup.
13107	120.0	103.4	12.50	61.40	73.70	26.30	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
13108	82.0	55.0	20.30	33.50	74.40	25.60	Compound molasses, sold by retail dealer as molasses; misrepresented; sale illegal.
13158	138.0	127.6	7.80	74.40	76.10	23.90	Compound sirup, misbranded. Branded "Crystal White Table Sirup"; sale illegal.
13139	37.4	15.4	39.80	0.00	75.40	24.60	Molasses.
12989	145.0	137.5	5.60	79.60	75.40	24.60	Compound sirup.
13153	147.0	138.6	6.30	80.40	77.20	22.80	do.
12703	139.0	133.0	4.50	76.80	75.60	24.40	do.
12711	46.0	16.5	47.10	0.00	73.50	26.50	Sirup.
12714	110.6	92.4	13.70	55.30	-----	-----	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
12718	106.0	88.0	13.50	52.80	78.00	22.00	Compound sirup. Was sold as sirup; misrepresented; sale was illegal.
12974	119.0	99.0	15.83	58.95	76.80	23.20	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
12758	42.0	14.3	42.40	0.00	76.60	23.40	Molasses.
12970	44.6	17.6	46.88	0.00	73.20	26.80	Sirup.
12990	46.0	17.6	47.90	0.00	73.60	26.40	do.
13067	42.0	17.6	44.90	0.00	74.50	25.50	Molasses.
13068	42.0	17.6	44.90	0.00	76.40	23.60	do.
13070	46.0	18.7	48.70	0.00	74.10	25.90	do.
13078	58.0	24.2	24.70	19.00	74.10	25.90	Compound molasses, sold by retail dealer as molasses; misrepresented; sale was illegal.
12700	127.0	114.4	9.50	67.10	-----	-----	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
13141	38.0	19.8	43.20	0.00	76.40	23.60	Molasses.
13109	38.0	17.6	41.90	0.00	76.90	23.10	do.

## RESULTS OF THE EXAMINATION OF MOLASSES

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
12749	Molasses, St. Catherine.	Molasses.....	P. Duff & Sons, Pittsburg, Pa.	White & Hathaway, Hertford.
12761	Sirup, Airio Brand.	Sirup.....	Dunbar Molasses and Sirup Co., New Orleans, La.	J. H. Everett Co., Farmville.
13072	Airio, Compound..	Sirup, Compound.	do.....	W. P. Surles, Dunn.....
13077	Molasses and Corn Sirup, Pecan.	Molasses.....	do.....	John J. Thrower & Co., Red Springs.
13084	Sirup, Airio.....	Sirup.....	do.....	D. McNair, Hamlet.....
13114	Compound, Polly..	Sirup, Compound.	do.....	J. J. Hathaway, Battleboro.
12731	Molasses and Corn Sirup, Powell Brand, No. 1.	Molasses.....	Edgerton Bros., Baltimore, Md.	E. K. Willis, Washington..
12732	-----	do.....	do.....	Harrison & Phillips, Washington.
12733	Molasses and Corn Sirup, Powell, No. 1.	do.....	do.....	Jackson & Roberson, Washington.
13096	-----	do.....	George S. Edwards & Co., Rocky Mount, N. C.	Oppenheimer's, Rocky Mount.
13099	-----	Sirup.....	do.....	Kelly Bryant & Bro., Rocky Mount.
13113	-----	do.....	-----	W. E. Edwards, Battleboro.
13095	-----	do.....	-----	M. C. Faber, Wilson.....
13140	Sirup, Table, Shirley Brand.	Sirup, Table, Compound.	Fleming & Christian Co., Richmond, Va.	Pettigrew-King Grocery Co., Burlington.
12741	-----	Molasses.....	J. B. Flora & Co., Elizabeth City, N. C.	J. M. LeRoy, Elizabeth City.
12729	Sirup, Morning Glory.	Sirup.....	Florida-Georgia Sirup Co., Jacksonville, Fla.	Coöperative Supply Co., New Bern.
13069	Sirup, Merrimac Table.	Sirup, Compound.	The Four Company, Norfolk, Va.	Champion Bros., Clayton..
12752	-----	Molasses.....	do.....	J. S. Northcott, Edenton...
12753	Sirup, Big Four Table.	Sirup, Table.....	do.....	Plymouth Supply Co., Plymouth.
12754	Molasses and Corn Sirup, Golden.	Molasses.....	do.....	do.....
12998	-----	Sirup.....	-----	John Frederick, Warsaw....
12724	Sirup, First Prize, Fancy Table.	Sirup, Compound Table.	Frey & Sons, Baltimore, Md.	Hancock Company, Beaufort.
13100	Sirup, Ga.-Fla., Cane and Corn.	Sirup, Compound.	C. B. Gay Co., Jacksonville, Fla.	C. R. S. Matthews, Rocky Mount.
13155	-----	Sirup.....	Gibbs Preserving Co., Baltimore, Md.	Meadow Supply Co., Madison.
12996	Sirup, Compound Corn and Refiners'.	do.....	J. T. Ginn & Co., Goldsboro, N. C.	M. W. Pope, Mount Olive...
12702	-----	do.....	do.....	W. R. Thompson, Goldsboro.

## AND SIRUPS AND SUBSTITUTES FOR SAME—Continued.

Laboratory Number.	Polarization, Direct, 20° C. °V.	Polarization, Invert, 20° C. °V.	Sucrose (Clerget) — Per Cent.	Glucose, Commercial (Leach's Formula) — Per Cent.	Solid Matter — Per Cent.	Water — Per Cent.	Remarks and Conclusions.
12749	31.0	14.3	34.10	0.00	75.00	25.00	Molasses
12761	96.0	60.5	26.70	39.60	74.30	25.70	Compound sirup, sold as sirup; misbranded; sale illegal.
13072	105.0	72.6	24.40	46.00	75.30	24.70	Compound sirup.
13077	76.0	35.2	30.70	25.70	74.80	25.20	Compound molasses, sold by retail dealer as molasses; misrepresented; sale illegal.
13084	111.0	84.7	19.80	52.10	76.20	23.80	Compound sirup, branded "Airio Sirup"; misbranded; explanation does not excuse misbranding; sale illegal.
13114	74.0	44.0	22.60	29.30	72.80	27.20	Compound sirup.
12731	126.0	101.2	18.60	61.30	77.20	22.80	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
12732	134.0	118.8	11.40	70.00	-----	-----	Compound molasses, sold as molasses; misrepresented; sale illegal.
12733	131.0	113.3	13.30	67.20	-----	-----	do.
13096	40.0	17.6	43.40	0.00	75.50	24.50	Molasses.
13099	98.0	68.2	22.40	43.20	76.70	23.30	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
13113	119.0	103.4	11.70	61.50	76.70	23.30	do.
13095	30.0	15.4	34.20	0.00	73.60	26.40	Sirup.
13140	152.0	151.8	0.00	87.00	76.40	23.60	Compound sirup. Was branded table sirup; misbranded; sale illegal. Explanation does not excuse misbranding.
12741	75.0	46.2	21.70	30.40	73.70	26.30	Compound molasses, sold as molasses; misrepresented; sale was illegal.
12729	66.0	25.3	30.60	20.20	69.10	30.90	Compound sirup, branded "Morning Glory Sirup"; misbranded; sale illegal.
13069	92.0	34.0	43.70	27.60	73.00	27.00	Compound sirup, sold by retail dealer as compound. Branded "Table Sirup"; misbranded; sale illegal.
12752	80.0	50.6	22.10	33.00	75.50	24.50	Compound molasses, sold by retail dealer as molasses; misrepresented; sale illegal.
12753	146.8	138.6	6.10	80.40	75.00	25.00	Compound sirup, branded "Table Sirup"; misbranded. Explanation does not excuse misbranding; sale illegal.
12754	88.0	59.4	21.50	38.00	75.90	24.10	Compound molasses, sold by retail dealer as molasses; misrepresented; sale illegal.
12998	40.0	17.6	43.41	0.00	75.00	25.00	Sirup.
12724	102.0	74.8	20.50	46.50	-----	-----	Compound sirup, branded "Fancy Table Sirup"; misbranded. Explanation does not excuse misbranding; sale illegal.
13100	126.0	112.0	10.40	66.00	75.20	24.80	Compound sirup.
13155	34.0	11.0	34.00	0.00	76.30	23.70	Sirup.
12996	126.0	112.2	10.40	66.05	-----	-----	Compound sirup, sold as sirup; misrepresented by retail dealer; sale illegal.
12702	34.0	13.2	35.50	0.00	77.20	22.80	Sirup.

## RESULTS OF THE EXAMINATION OF MOLASSES

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
12708	-----	Molasses	Goldsboro Grocery Co., Goldsboro, N. C.	J. T. Hinson, Goldsboro
12759	-----	do	Greenville Wholesale Co., Greenville, N. C.	J. Long, Greenville
12973	-----	Sirup	Fred J. Hollies & Co., Bennettsville, S. C.	McLaurin & Shaw, Laurinburg.
13079	-----	Molasses	Hall & Pearsall, Wilmington, N. C.	W. J. Council, Red Springs.
13152	-----	Sirup	Hancock Grocery Co., Winston-Salem, N. C.	H. E. Faircloth, Winston-Salem.
12986	Sirup, Ingleside Cane.	do	Hardaway-Cargill Co., Columbus, Ga.	W. N. Jeans, Wadesboro
12965	-----	do	F. E. Hashagen Co., Wilmington, N. C.	M. J. Schulken, Wilmington.
13119	-----	Molasses(cheap)	-----	C. E. Hawkins, Littleton
12972	Sirup, Compound, Montrose.	Sirup, Compound.	Hearne & Jones, New Orleans, La.	E. L. Burns, Maxton
12983	-----	Sirup	Heath-Morrow Co., Monroe, N. C.	J. T. Pinkston & Son, Wadesboro.
12712	-----	do	Harvey C. Hines, Kinston, N. C.	W. W. Rouse, Kinston
13127	-----	do	Henderson Grocery Co., Henderson, N. C.	C. D. Horton, Henderson
12747	-----	Molasses	Hubbard-Slack Co., Norfolk, Va.	J. E. Howell, Hertford
13148	Sirup, Compound, Lion Golden Drip	Sirup, Compound.	Hudson Mfg. Co., New York, N. Y.	A. & P. Tea Co., Greensboro.
13089	-----	Molasses	Hurwitz & Bro., Carthage	B. Hurwitz & Bro., Carthage.
12993	-----	Molasses, Porto Rico.	-----	J. T. Jamison & Co., Charlotte.
12701	Sirup, Corn, Silver Spray.	Sirup, Compound.	Jones Bros., Castleman & Blake-more Co., Louisville, Ky.	L. A. Raney, Goldsboro
13144	-----	Molasses	J. W. Jones & Co., Greensboro, N. C.	Hudson Grocery Co., Greensboro.
12979	-----	Sirup	Kuester-Lowe Co., Charlotte, N. C.	C. A. Porter, Rockingham
13088	Sirup, Corn, Creole Belle.	Sirup, Corn, and Molasses.	Langhoff Bros. Co., New Orleans, La.	J. S. Huntress, Southern Pines.
12740	-----	Molasses	do	H. F. Noble, Belhaven
12720	New Orleans, Cosa Natural.	Sirup	do	J. C. Helms, Morehead City.
12721	Molasses, Cuba Belle.	Molasses	do	do
12985	-----	Sirup	do	Burns Bros., Wadesboro
12756	-----	Molasses	-----	Latham-Owens Co., Plymouth.
12988	Blue Ribbon	Sirup	-----	Latham & Richardson, Monroe.
13105	-----	do	-----	Lawrence Bros., Enfield
13106	-----	Molasses	-----	do
12994	-----	Molasses, Porto Rico.	-----	S. R. Lentz, Charlotte

AND SIRUPS AND SUBSTITUTES FOR SAME—*Continued.*

Laboratory Number.	Polarization, Direct, 20° C. % V.	Polarization, Insert, 20° C. % V.	Sucrose (Clerget)—Per Cent.	Glucose, Commercial (Leach's Formula)—Per Cent.	Solid Matter—Per Cent.	Water—Per Cent.	Remarks and Conclusions.
12708	133.0	15.4	36.40	0.00	77.50	22.50	Molasses.
12759	98.0	77.0	15.80	46.90	76.40	23.60	Compound molasses, sold as molasses; misrepresented; sale illegal.
12973	100.0	74.8	16.73	47.58	75.60	24.40	Compound sirup, sold as sirup; misrepresented; sale illegal.
13079	105.0	85.8	14.50	51.70	76.50	23.50	Compound molasses, sold by retail dealer as molasses; misrepresented; sale illegal.
13152	118.0	105.6	9.30	62.10	76.60	23.40	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
12986	47.0	22.0	52.00	0.00	73.00	27.00	Sirup.
12965	93.0	58.0	26.40	38.00	73.30	26.70	Compound sirup, sold as sirup; misrepresented; sale illegal.
13119	37.6	12.3	37.60	0.00	75.70	24.30	Molasses.
12972	131.0	115.0	12.06	67.95	74.20	25.80	Compound sirup.
12983	43.0	22.0	49.00	0.00	75.20	24.80	Sirup.
12712	40.0	15.4	41.70	0.00	75.40	24.60	do.
13127	121.0	102.3	14.00	61.10	76.20	23.80	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
12747	30.0	14.3	33.30	0.00	77.00	23.00	Molasses.
13148	90.0	88.0	1.50	50.50	77.90	22.10	Compound sirup.
13089	34.0	15.4	37.20	0.00	77.20	22.80	Molasses.
12993	40.0	17.5	43.30	0.00	73.40	26.60	do.
12701	123.0	114.4	6.40	66.60	75.00	25.00	Corn sirup, cane flavor.
13144	46.0	17.6	47.90	0.00	74.20	25.80	Molasses.
12979	122.0	112.2	7.40	65.50	76.50	23.50	Compound sirup. Dealer sold as sirup; misrepresented; sale illegal.
13088	111.0	84.6	19.90	52.00	70.80	29.20	Compound sirup.
12740	28.0	13.2	31.00	0.00	75.30	24.70	Molasses.
12720	116.0	86.9	21.90	52.00	-----	-----	Compound sirup. Retail dealer sold as sirup; misrepresented; sale illegal.
12721	35.0	15.4	38.00	-----	72.50	27.50	Molasses.
12985	136.0	122.0	10.50	71.70	78.60	21.40	Compound sirup, sold by dealer as sirup; misrepresented; sale illegal.
12756	35.0	17.6	39.60	0.00	76.90	23.10	Molasses.
12988	108.0	82.5	19.20	50.40	79.00	21.00	Compound sirup, sold by dealer as sirup; misrepresented; sale illegal.
13105	50.0	15.4	33.60	9.40	77.90	22.10	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
13106	20.0	13.2	25.00	0.00	70.20	29.80	Molasses.
12994	34.0	13.2	35.50	0.00	75.70	24.30	do.

## RESULTS OF THE EXAMINATION OF MOLASSES

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13123	Sirup, Compound, King.	Sirup.....	Mongles-Herald Co., Baltimore, Md.	Ballard-Cheatham Co., Franklinton.
12746	Sirup, Maryland, Fancy Table.	Sirup, Table.....	do.....	Morgan & Parker, Elizabeth City.
12726	Sirup, Compound, Silver Drip.	Sirup, Compound.....	do.....	Lucas & Lewis, New Bern..
12725	Sirup, Corn and Molasses, King.	Molasses.....	do.....	J. T. Clark, New Bern.....
12750		do.....		W. A. Mansfield, Edenton..
12738		do.....		H. W. Martin, Belhaven....
13104		Sirup.....		S. Meyer, Enfield.....
12734		do.....	E. R. Mixon & Co., Washington, N. C.	Johnson & Roberson, Washington.
12735		Molasses.....	do.....	J. E. Adams, Washington...
13085		Sirup.....	Monger-Hatch Co., Sanford, N.C.	Nisbet & Womble, Sanford.
13115		do.....		L. J. Moore, Weldon.....
12745		do.....		Morrisette Bros., Elizabeth City.
13093	Sirup, Corn and Cane, White Rabbit.	Sirup, Corn and Cane.	New Orleans Coffee Co., New Orleans, La.	D. C. Braswell, Wilson.....
13102	Sirup, Compound, Raven.	Sirup, Compound.....	do.....	D. C. Bell, Halifax.....
12995		Sirup.....		T. W. Parker, Mount Olive.
12982		do.....	Parson-Hardison Co., Wadesboro, N. C.	E. L. Hanna, Wadesboro...
13150	Sirup, Velva Breakfast.	do.....	Penick & Ford, New Orleans, La.	S. S. Morris, Greensboro....
13146	Molasses, Aunt Dinah.	Molasses.....	do.....	Tucker & Erwin, Greensboro.
13082	Sirup, Velva Breakfast.	Cane Sirup.....	do.....	C. V. Williams & Co., Hamlet.
13081	Sirup, Cane and Corn, Velva.	Sirup, Compound.....	do.....	do.....
13074		Sirup.....	do.....	J. F. Powers & Son, Fayetteville.
12987		do.....	do.....	Polk Bros., Monroe.....
12969	Sirup, Georgia Cane, Ingleside.	do.....	do.....	Peoples Supply Co., Wilmington.
12705	Sirup, Velva.....	do.....	do.....	C. D. Taylor & Co., Goldsboro.
12730	Molasses and Sirup, Powell.	Molasses.....	E. Peterson Co., Washington, N. C.	A. J. Cox & Co., Washington.
12704	Fancy Crystal.....	Sirup.....	R. E. Pipkin, Goldsboro, N. C.	W. M. Smith, Goldsboro...
12709		do.....	H. A. Powell Grocery Co., Goldsboro.	H. A. Powell Grocery Co., Goldsboro.
13086		Molasses.....		Powers & Miller, Sanford...

AND SIRUPS AND SUBSTITUTES FOR SAME—*Continued.*

Laboratory Number.	Polarization, Direct, 20° C. °V.	Polarization, Invert, 20° C. °V.	Sucrose (Clerget)—Per Cent.	Glucose, Commercial (Leach's Formula)—Per Cent.	Solid Matter—Per Cent.	Water—Per Cent.	Remarks and Conclusions.
13123	130.0	114.4	11.70	67.60	77.20	22.80	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
12746	102.0	77.0	26.30	43.20	-----	-----	Compound sirup, branded "Fancy Table Sirup"; misbranded; sale illegal.
12726	140.0	129.8	7.70	75.60	-----	-----	Compound sirup, branded "Silver Drip Sirup"; misbranded. Explanation does not excuse misbranding; sale illegal.
12725	122.0	97.2	18.60	59.00	77.20	22.80	Compound sirup and molasses, branded "Porto Rico Style"; misbranded; sale illegal.
12750	34.0	13.2	35.50	0.00	75.20	24.80	Molasses.
12738	62.0	26.4	26.80	20.10	76.50	23.50	Compound molasses, sold by retail dealer as molasses; misrepresented; sale illegal.
13104	119.0	110.0	6.70	64.10	73.80	26.20	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
12734	123.0	111.1	8.90	65.20	77.50	22.50	do.
12735	124.0	100.0	18.00	60.50	78.00	22.00	Compound molasses, sold by retail dealer as molasses; misrepresented; sale illegal.
13085	42.0	18.7	45.70	0.00	74.30	25.70	Sirup.
13115	34.0	15.4	37.20	0.00	79.70	20.30	do.
12745	160.0	159.7	0.00	91.40	-----	-----	Compound sirup; misrepresented. Was sold by retail dealer as sirup; sale illegal.
13093	94.0	74.8	14.50	45.40	72.90	29.10	Compound sirup.
13102	82.0	57.2	18.70	36.20	74.80	25.20	do.
12995	129.0	117.7	8.51	68.85	-----	-----	Compound sirup, sold as sirup; misrepresented; sale illegal.
12982	34.0	20.9	41.30	0.00	73.60	26.40	Sirup.
13150	54.0	22.0	57.30	0.00	73.30	26.70	do.
13146	16.0	17.6	25.30	0.00	73.90	26.10	Molasses.
13082	46.0	20.9	50.40	0.00	75.80	24.20	Sirup.
13081	99.0	67.1	24.00	42.70	72.60	27.40	Compound sirup.
13074	48.0	16.5	48.60	0.00	74.10	25.90	Sirup.
12987	42.0	20.9	47.40	0.00	73.00	27.00	do.
12969	50.0	22.0	54.27	0.00	74.50	25.50	do.
12705	91.6	61.8	22.40	39.40	73.10	26.90	Compound sirup, branded "Velva Sirup." Explanation does not excuse misbranding; misbranded; sale illegal.
12730	128.0	110.0	13.50	65.40	-----	-----	Compound molasses, sold as molasses; misrepresented; sale illegal.
12704	86.0	55.2	23.20	18.30	-----	-----	Compound sirup, branded "Fancy Crystal Sirup"; misbranded; sale illegal.
12709	134.0	123.2	8.20	71.90	76.00	24.00	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
13086	93.0	71.5	15.40	44.20	73.90	26.10	Compound molasses, sold by retail dealer as molasses; misrepresented; sale illegal.

## RESULTS OF THE EXAMINATION OF MOLASSES

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13117	-----	Molasses	Reavis-Barrow-Stuart Co., Franklinton, N. C.	J. R. C. Faison, Littleton...
13126	-----	Sirup	P. A. Reavis & Co., Louisburg, N. C.	A. W. Perry, Jr., & Co., Louisburg.
13149	Sirup, Favorite Table.	Sirup Compound.	Rigney & Co., Brooklyn, N. Y.	C. Scott & Co., Greensboro.
13080	-----	Sirup, Georgia Cane.	Roddenberg Planting Co., Atlanta, Ga.	C. V. Williams & Co., Hamlet.
12992	-----	Molasses, Porto Rico.	-----	L. L. Surratt, Charlotte...
12991	-----	Molasses, New Orleans.	-----	do
13136	Molasses, Compound.	Molasses	E. A. Saunders & Sons Co., Richmond, Va.	Byrd & Upchurch, Durham
13124	-----	Sirup	do	Franklinton Grocery Co., Franklinton.
13135	Sirup, Corn and Cane, Silver Drip	do	do	Byrd & Upchurch, Durham
13130	-----	Molasses	do	J. D. Brooks, Oxford.
13129	-----	Sirup	do	do
13147	Molasses, Porto Rico Fancy, MonogramXXXX	Molasses	do	Troxler Bros., Greensboro...
13143	Sirup, Corn and Cane, Silver Drip.	Sirup Compound.	do	Harris & Hubbard, Reidsville.
13134	Molasses, Porto Rico Fancy, Monogram XXXX.	Molasses	do	Perry Grocery Co., Durham.
13122	-----	Sirup	do	Sterling Store Co., Franklinton.
13121	-----	do	do	C. S. Williams, Franklinton
12760	-----	do	do	W. H. Johnson, Greenville...
12736	-----	Molasses	Sawyer Grocery Co., Belhaven, N. C.	J. F. Bishop, Belhaven.
12717	Sirup, Imperial Corn and Refiners'	Sirup Compound.	T. S. Southgate & Co., Norfolk, Va.	Burrell Stroud, Kinston.
12978	-----	Sirup	-----	C. C. Shores & Co., Rockingham.
13076	Sirup, Peacock	Sirup, Cane	Southern Sirup Co. Montgomery, Ala.	M. A. Bethune, Fayetteville.
13073	Sirup, Cane and Corn, Peacock.	Sirup, Cane and Corn.	do	A. S. Melvin, Fayetteville..
12742	-----	Sirup	Stewart Knatz, Baltimore, Md.	W. H. Cartwright & Son, Elizabeth City.
13125	Sirup, Golden Crown.	do	do	McGhee-Joyner Co., Franklinton.
12707	Sirup, Compound, Golden Crown.	do	do	James W. Cole, Goldsboro..
13133	-----	do	Stokes-Grymes Grocery Co., Richmond, Va.	L. Thomas, Oxford.

## AND SIRUPS AND SUBSTITUTES FOR SAME—Continued.

Laboratory Number.	Polarization, Direct, 20° C. %V.	Polarization, Invert, 20° C. %V.	Sucrose (Clerget)—Per Cent.	Glucose, Commercial (Leach's Formula)—Per Cent.	Solid Matter—Per Cent.	Water—Per Cent.	Remarks and Conclusions.
13117	43.0	15.4	44.00	0.00	77.70*	22.30	Molasses.
13126	115.0	99.0	12.00	58.80	66.90	33.10	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
13149	110.0	92.4	13.30	55.20	78.30	21.70	Compound sirup, branded "Favorite Table Sirup"; misbranded. Explanation does not excuse misbranding; sale illegal.
13080	46.0	22.0	51.30	0.00	73.50	26.50	Sirup.
12992	42.0	15.4	43.20	0.00	75.90	24.10	Molasses.
12991	92.6	55.0	28.30	36.70	74.00	26.00	Compound molasses, sold by retail dealer as "New Orleans Molasses"; misrepresented; sale illegal.
13136	75.0	46.2	21.70	30.40	72.40	27.60	Compound molasses, sold by retail dealer as molasses; misrepresented; sale illegal.
13124	114.0	97.9	11.10	58.80	77.20	22.80	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
13135	116.0	101.2	11.10	60.00	77.10	22.90	do.
13130	26.0	13.2	29.50	0.00	72.80	27.20	Molasses.
13129	134.0	124.3	7.30	72.40	74.30	25.70	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
13147	42.0	16.5	44.00	0.00	75.20	24.80	Molasses.
13143	121.0	106.7	10.70	63.00	75.60	24.40	Compound sirup.
13134	39.0	18.7	43.50	0.00	74.00	26.00	Molasses.
13122	126.0	114.0	8.70	67.00	75.40	24.60	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
13121	119.0	101.2	13.40	60.30	76.20	23.80	do.
12760	120.0	103.4	11.70	61.80	77.20	22.80	Compound sirup; misrepresented; was sold as sirup; sale illegal.
12736	40.0	17.6	43.40	0.00	75.80	24.20	Molasses.
12717	131.6	121.8	7.40	70.90	75.60	24.40	Compound sirup.
12978	84.0	57.2	20.20	36.40	77.00	23.00	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
13076	49.0	20.9	52.60	0.00	74.20	25.80	Sirup.
13073	96.0	68.2	20.90	42.90	75.00	25.00	Compound sirup.
12742	110.0	93.5	12.40	55.70	-----	-----	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
13125	117.0	99.0	13.50	59.10	76.60	23.40	do.
12707	122.0	110.0	9.00	64.60	-----	-----	do.
13133	159.0	155.0	3.00	89.00	76.90	23.10	do.

## RESULTS OF THE EXAMINATION OF MOLASSES

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13132	Sirup, Old Time Table.	Sirup, Table...	Stokes-Grimes Grocery Co., Richmond, Va.	Cannady & Alston, Oxford.
12763	-----do-----	Sirup, Table Compound.	-----do-----	W. H. Etheridge, Selma....
12762	Sirup, Table, Pen Mar.	Sirup, Table...	J. Stromeier & Co., Philadelphia, Pa.	Rasberry & Thorne, Farmville.
13151	Sorghum and Corn Sirup, Silk Ribbon	Molasses, Home Made.	Torbitt & Castleman, Louisville, Ky.	Bodenheimer Bros., Waughtown.
12744	Sirup, Crystal White.	Sirup, Table...	-----do-----	Morrisette Bros., Elizabeth City.
13071	Sirup. Gold Seal...	Sirup.....	-----do-----	H. O. Mattox, Dunn.....
13131	-----do-----	-----do-----	The Thomas-Howard Co., Durham, N. C.	Cannady & Alston, Oxford.
12887	Sirup, Compound, Medallion.	Sirup, Compound.	S. J. Van Lill Co., Baltimore, Md.	B. B. Davenport, New Bern.
12737	-----do-----	Molasses.....	W. H. Weatherly, Elizabeth City, N. C.	R. L. Smith, Belhaven.....
13145	Sirup, Hot Cake Table, Honey Dew	Sirup, Table...	The J. Weller Co., Cincinnati, Ohio.	Tucker & Erwin, Greensboro.
13156	-----do-----	Sirup.....	West-Hill Co., Mount Airy, N. C.	R. C. Poore, Mount Airy...
13138	-----do-----	Molasses.....	A. S. White & Co., Lynchburg, Va.	J. A. Isley & Bro. Co., Burlington.
12976	-----do-----	Sirup.....	-----do-----	E. D. Whitlock, Rockingham.
12980	Sorghum and Corn Sirup, Southern Farm.	-----do-----	D. R. Wilder Mfg. Co., Atlanta, Ga.	E. N. Covington & Co., Rockingham.
12977	Sirup, Uniform Georgia Cane.	-----do-----	-----do-----	Watson-King Co., Rockingham.
12743	-----do-----	-----do-----	R. C. Williams & Co., New York, N. Y.	Pritchard & Jackson, Elizabeth City.
12727	Sirup, Table Crystal Drip.	-----do-----	Willis Grocery Co., New Bern, N. C.	Willis Grocery Co., New Bern.
12728	-----do-----	Sirup.....	-----do-----	-----do-----
13094	-----do-----	Molasses.....	C. Woodard Co., Wilson, N. C.	J. W. Riley, Wilson .....
12755	Sirup, Refiners', Lynnhaven.	Sirup.....	E. L. Woodard & Co., Norfolk, Va.	J. O. Everett Co., Plymouth.
12966	-----do-----	Molasses.....	R. A. Wright, Wilmington, N. C.	W. D. Borneman, Wilmington.

AND SIRUPS AND SUBSTITUTES FOR SAME—*Continued.*

Laboratory Number.	Polarization, Direct, 20° C. °V.	Polarization, Insert, 20° C. °V.	Sucrose (Clerget)—Per Cent.	Glucose, Commercial (Leach's Formula)—Per Cent.	Solid Matter—Per Cent.	Water—Per Cent.	Remarks and Conclusions.
13132	155.0	150.7	3.20	86.70	77.50	22.50	Compound sirup, branded "Old Time Table Sirup." Misbranded; explanation does not excuse misbranding; sale illegal.
12763	154.0	149.6	3.30	86.10	-----	-----	do.
12762	24.0	22.0	34.60	0.00	-----	-----	Sirup.
13151	94.0	73.5	15.40	44.90	76.00	24.00	Compound sirup, sold as "Home Made Molasses"; misrepresented; sale illegal.
12744	144.0	132.0	9.00	78.20	74.70	25.30	Compound sirup, branded "Table Sirup." Misbranded; explanation does not excuse misbranding; sale illegal.
13071	47.0	21.3	51.40	0.00	73.90	26.10	Sirup.
13131	154.0	148.5	4.20	85.60	77.30	22.70	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
12887	131.6	118.8	9.60	69.70	-----	-----	Compound sirup.
12737	106.0	81.4	18.50	50.00	-----	-----	Compound molasses, sold by retail dealer as molasses; misrepresented; sale illegal.
13145	156.0	156.0	0.00	85.70	75.50	24.50	Compound sirup, branded "Honey Dew Hot Cake Table Sirup"; misbranded; sale illegal.
13156	115.6	96.8	14.10	58.00	76.60	23.40	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
13138	26.0	17.6	32.80	0.00	78.80	21.20	Molasses.
12976	50.6	22.0	54.72	0.00	72.70	27.30	Sirup.
12980	90.0	68.2	16.40	42.00	75.20	24.80	Compound sirup, not properly branded; sale illegal.
12977	50.0	22.0	54.27	0.00	73.40	26.60	Sirup.
12743	149.0	144.0	3.80	83.00	76.50	-----	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
12727	127.0	110.0	12.80	65.20	78.30	21.70	Compound sirup, branded "Table Sirup." Misbranded; explanation does not excuse misbranding; sale illegal.
12728	128.0	112.2	11.40	57.60	-----	-----	Compound sirup, sold by retail dealer as sirup; misrepresented; sale illegal.
13094	40.0	17.6	43.40	0.00	73.70	26.30	Molasses.
12755	36.0	15.4	38.70	0.00	77.60	22.40	Sirup, adulterated with refiners' sirup; sale was illegal. Can be sold as refiners' sirup.
12966	32.0	15.4	35.73	0.00	76.00	24.00	Molasses.

## OLIVE AND OTHER TABLE AND COOKING OILS.

Olive oil is the oil obtained from the sound, mature fruit of the cultivated olive tree. It is a very choice table oil and is largely used. It was formerly much adulterated, but the enforcement of the food laws has reduced the adulteration of it to a minimum.

## RESULTS OF THE EXAM

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.
13514	Olive Oil, Gold Seal Brand.....	Alart & McGuire Co., New York, N. Y.....
13738	.....	.....
13521	Olive Oil, Absolutely Pure, Virgin French.....	Clotworthy Chemical Co., Baltimore, Md.....
11366	Olive Oil, Heinz Pure.....	H. J. Heinz Co., Pittsburg, Pa.....
11365	Olive Oil, Pompeian.....	The Pompeian Grocery Co., Washington, D. C.....
14108	.....do.....	.....do.....

## ORANGE EXTRACT AND ORANGE EXTRACT SUBSTITUTES.

## DEFINITIONS AND STANDARDS.

Orange extract is the flavoring extract prepared from oil of orange, or from orange peel, or both, and contains not less than 5 per cent by volume of oil of orange. Oil of orange is the volatile oil obtained from the fresh peel of the orange.

## RESULTS OF THE EXAMINATION OF ORANGE

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13538	Orange Extract, Pure Food, Sunbeam.	Austin-Nichols Co., New York, N. Y..	Oppenheimer's, Rocky Mount.
12921	Bailey's Standard Dime Orange Flavoring.	James Bailey & Son, Baltimore, Md...	Turnage Bros., Ayden.....
13540	Orange, Kitchen Queen.....	Interstate Chemical Co., Baltimore, Md.	C. Scott & Co., Greensboro...
13539	Orange Flavor.....	C. E. King & Sons, Durham, N. C....	C. E. King & Sons, Durham...
13541	Orange Extract, Alcohol 50%.	Surry Drug Co., Elkin, N. C.....	Holcomb Bros., Elkin.....
13537	Orange Extract, Watkins.....	J. R. Watkins Medicine Co., Winona, Minn.	J. F. Powers & Son, Fayetteville.
12916	Orange Extract, Artificially Colored.	Williams, Martin & Gray, Norfolk, Va.	N. W. Tarkinton, Belhaven...

Six samples of olive oil were examined, and the results of the examinations are reported in the table below. There appeared to be no adulteration or misbranding of them.

## INATION OF OLIVE OILS.

Laboratory Number.	Retail Dealer or Party Who Sent Sample for Analysis.	Halphen's Test for Cotton-seed Oil.	Reading Refractometer, 15.5° C.	Refractive Index.	Remarks and Conclusions.
13514	Perry Grocery Co., Durham.....	Negative.....	69.8	1.4721	Olive Oil.
13738	J. E. Britt, Clinton.....	do.....	68.6	1.4713	do.
13521	W. D. James, Mount Olive.....	do.....	67.9	1.4710	do.
11366	M. R. Jennette, Mount Olive.....	do.....	68.5	1.4713	do.
11365	C. H. Borneman, Wilmington.....	do.....	68.3	1.4712	do.
14108	Miller Bros., Waynesville.....	do.....	68.0	1.4710	do.

Seven samples of orange extract and orange extract substitutes have been examined, two of which were imitations or substitutes, and two others below standard. As these four samples were adulterated or misbranded, their sale was illegal.

See table below.

## EXTRACTS AND ORANGE EXTRACT SUBSTITUTES.

Laboratory Number.	Orange Oil (by Precipitation)—Per Cent by Volume.	Orange Oil (by Polarization)—Per Cent by Volume.	Reading Refractometer, 15.5° C.	Refractive Index.	Alcohol (by Volume)—Per Cent.	Remarks and Conclusions.
13538	5.20	5.20	74.6	1.4752	88.36	Orange extract.
12921	5.40	-----	75.3	1.4756	78.74	do.
13540	5.00	4.80	74.6	1.4752	76.72	Orange extract, not properly branded. It is branded orange, when it is an extract; sale illegal.
13539	0.00	0.00	-----	-----	42.60	Imitation orange extract; misbranded; sale illegal.
13541	0.00	0.00	-----	-----	39.12	Imitation orange extract; misbranded on carton; sale illegal.
13537	5.10	5.00	74.6	1.4752	80.36	Orange extract.
12916	-----	3.00	75.3	1.4756	81.00	Orange extract, below standard; adulterated; sale illegal.

## CANNED PEAS.

## DEFINITIONS AND STANDARDS.

Canned peas are sound, properly matured and prepared fresh peas sterilized by heat, kept in suitable, clean, hermetically sealed containers, from which they take up no metallic substance, and conform in name to the peas used in their preparation.

The State Food Law provides that a food product shall be deemed to be adulterated: If it be mixed, colored, powdered, coated, or stained in a manner whereby damage or infirmity is concealed, or if it contains any added poisonous or other added deleterious ingredient which may render such article injurious to health. It is and has been quite a practice among packers to green or artificially color canned vegetables with copper salts.

The question of whether the greening of vegetables for human food with copper salts constitutes a violation of the National Food Law was referred by the Secretary of Agriculture to the Referee Board of Consulting Scientific Experts in March of 1909. After an exhaustive investigation of the subject the "Referee Board" reports to the Secretary as follows:

## RESULTS OF THE EXAMINA

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13557	Peas, Figuer, Uncolored.....	Austin-Nichols Co., New York, N. Y.	C. V. Williams & Co., Hamlet
13553	Peas, Fine, Corbeille.....	do.....	H. A. Powell Grocery Co., Goldsboro.
14113	Peas, Medium, Plazant.....	do.....	Troxler Bros., Greensboro.....
13560	Peas, French, Le Soleil Malines.....	do.....	City Grocery Co., Henderson.
13558	Peas, Le Soleil Malines, Colored with Sulphate of Copper.	do.....	Carroll Grocery Co., Wilson..
14111	Peas, Extra Touraine, Colored with Sulphate of Copper.	Edward Depew & Co., New York, N. Y.	W. J. Byrd, Fayetteville.....
14110	Peas, Extra Touraine, Colored with Sulphate of Copper.	do.....	S. Maxwell & Co., Hendersonville.
13552	Peas, Italian, Extra Fine.....	do.....	C. M. Fite, Charlotte.....
13561	Peas, Very Fine, Amato, Colored with Sulphate of Copper.	France Conserves Co., Paris, France.	Perry Grocery Co., Durham..
14112	Peas, Extra Fine, La Reive.....	International Pure Food Co., New York, N. Y.	Troxler Bros., Greensboro.....
13555	Peas, Extra Fine, La Rose Blanche.	Lewis-Hubbard-Slack Co., Norfolk, Va.	Rasberry & Thorne, Farmville.
13550	Peas, Extra Fine, Italian Beaumarchand.	Moore & Co., Philadelphia, Pa.....	Holmes Grocery Co., Wilmington.
13554	Peas, Beaumarchand.....	do.....	E. B. Hackburn, New Bern..
13562	Peas, Extra Fine, Sugar, La Corbeille, Wespalaer.	do.....	Perry Grocery Co., Durham..
13563	Peas, Yacht Club, R. Beziers.....	do.....	do.....

"Copper salts used in the greening of vegetables may have the effect of concealing infirmity, inasmuch as the bright green color imparted to the vegetable simulates a state of freshness they may not have possessed before treatment.

"It appears from our investigation that, in certain directions, even such small quantities of copper may have a deleterious action and must be considered injurious to health."

As the use in food of an ingredient which may render the latter injurious to health is a violation of the State Food Law, and as the Referee Board of Scientific Experts have said in their report that even a small quantity of copper may have a deleterious action and must be considered injurious to health, this Department will consider the sale in North Carolina of vegetables colored with copper salts a violation of the State Food Law.

The dealers of the State have had notice and been warned that such violations will be prosecuted under the law. Still some of them continue to offer products so adulterated for sale.

The results of the examination of samples during the year are published in table below.

#### TION OF CANNED PEAS.

Laboratory Number.	Adulterants.	Remarks and Conclusions.
13557	None found.....	Canned peas.
13553	Copper sulphate....	Canned peas, containing copper sulphate; adulterated; sale illegal.
14113	None found.....	Canned peas.
13560	do.....	do.
13558	Copper sulphate....	Canned peas, containing copper sulphate; adulterated; sale illegal.
14111	do.....	do.
14110	do.....	do.
13552	None found.....	Canned peas.
13561	Copper sulphate....	Canned peas, containing copper sulphate; adulterated; sale illegal.
14112	None found.....	Canned peas.
13555	Copper sulphate....	Canned peas, containing copper sulphate; adulterated; sale illegal.
13550	None found.....	Canned peas.
13554	do.....	do.
13562	do.....	do.
13563	do.....	do.

## RESULTS OF THE EXAMINATION

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13551	Peas, Fine, Natural, L. A. Price.	L. A. Price, Bordeaux, France.....	W. H. Moffitt, Lexington.....
13564	Peas, Amato, Colored with Sulphate of Copper.	Thomas-Howard Co., Durham, N. C.	Pickett & Williams, Durham.
13565	do.	do.	Hurst & Edwards, Durham..
14109	Peas, Imported, Extra, Natural, Barton.	Welch & Evans, Charleston, S. C..	P. W. Ebeltoft, Shelby.....
13566	String Beans, French Prepared, Beaumarchand.	R. C. Williams & Co., New York, N. Y.	A. P. Grizzard, Winston-Salem.
13567	Peas, Beaumarchand, Colored with Sulphate of Copper.	do.	do.
13559	Peas, Plazant.	do.	O. O. Boykin, Tarboro.....
13556	Peas, No. 2, Medium, Belgium, Le Soleil, Colored with Sulphate of Copper.	do.	W. A. Phillips, Fayetteville...

## PEPPERMINT EXTRACT.

## DEFINITIONS AND STANDARDS.

Peppermint extract is the flavoring extract prepared from oil of peppermint, or from peppermint, or both, and contains not less than 3 per cent by volume of oil of peppermint. Oil of peppermint is the volatile oil obtained from peppermint.

## RESULTS OF THE EXAMINATION

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13544	Peppermint Extract, Justice....	Justice Drug Co., Greensboro, N. C.	J. S. Sockwell, Greensboro ...
13543	Peppermint, Essence.....	Peabody Drug Co., Durham, N. C.	Peabody Drug Co., Durham.
12606	Peppermint Flavor, Artificially Colored.	Dr. T. C. Smith, Asheville, N. C..	L. J. Moody & Co., Bryson City.
13545	Peppermint, Essence, Our Seal Brand.	Vaughn-Crutchfield Co., Winston-Salem.	Meador Supply Co., Madison
13542	Peppermint, Pure Fruit Flavor.	We-Li-Ka Mfg. Co., Memphis, Tenn.	Otis Winborne, Wilson.....
12918	do.	do.	C. W. Stevens & Co., Elizabeth City.

OF CANNED PEAS—*Continued.*

Laboratory Number.	Adulterants.	Remarks and Conclusions.
13551	None found.....	Canned peas.
13564	Copper sulphate....	Canned peas, containing copper sulphate; adulterated; sale illegal.
13565	....do.....	do.
14109	None found.....	Canned peas.
13566	Copper sulphate....	Canned beans, containing copper sulphate; adulterated; sale illegal.
13567	....do.....	Canned peas, containing copper sulphate; adulterated; sale illegal.
13559	None found.....	Canned peas.
13556	Copper sulphate....	Canned peas, containing copper sulphate; adulterated; sale illegal.

The results of the examination of six samples of peppermint extracts are reported in table below. Three of them proved to be good, strong extracts, two of which were more than double strength, while the other three contained less than 3 per cent of peppermint oil, and, being below standard, were sold in violation of the law.

See table below.

## OF PEPPERMINT EXTRACTS.

Laboratory Number.	Oil of Peppermint (by Precipitation).	Alcohol (by Volume)—Per Cent.	Remarks and Conclusions.
13544	8.40	81.72	Peppermint extract, concentrated.
13543	7.20	82.44	do.
12606	4.60	.....	Peppermint extract.
13545	2.50	.....	Peppermint extract, slightly below standard; sale illegal.
13542	2.40	.....	Peppermint extract, below standard; sale illegal.
12918	2.40	.....	Peppermint extract, slightly below standard; adulterated; sale illegal.

## RICE.

A large percentage of the rice on the market is coated or polished with glucose and talc.

Under the National Food Law, and the regulations of the United States Department of Agriculture, the use of talc and glucose as a coating for rice, in interstate commerce, is permitted, provided that the label of each package bears the following statement: "Coated with glucose and talc. Remove by washing."

Rice coated with glucose and talc, to comply with the requirements of

## RESULTS OF THE EX

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13572	Nogara Rice.....	Aragon Coffee Co., Richmond, Va..	A. G. Bowman & Son, Mount Airy.
13571	do.....	do.....	L. Thomas, Oxford.....
13570	do.....	do.....	J. M. LeRoy, Elizabeth City.
14145	do.....	do.....	Miller Grocery Co., North Wilkesboro.
14144	do.....	do.....	Allen & Ulrich, North Wilkesboro.
13569	Hotel Astor, Uncoated.....	B. Fischer & Co., New York, N. Y..	Polk Bros., Monroe.....
14147	Rice, Full Dress, Absolutely Pure, Uncoated.	James G. Gill Co., Norfolk, Va.....	C. A. Jones, Winston-Salem..
14146	do.....	do.....	Center Mercantile Co., Winston-Salem.
13568	Toxaway, Coated with Glucose and Talc.	Imperial Coffee Co., Richmond, Va.	A. P. Barrett, Rockingham...
14143	Rice, Japan Style, Old Time Brand.	Stokes-Grymes Grocery Co., Richmond, Va.	E. M. Towns, Reidsville.....

## SALT FISH.

During the latter part of September the attention of the Food Officials was called to what appeared to be illness produced from eating salt fish, mullets.

It is not unusual for people to suspect that they have been made ill or poisoned by having eaten certain food, and present the matter to the Department to be investigated, without having much evidence upon which to base their suspicion.

In this case there appeared to be sufficient evidence to justify an investigation, which was made. The investigation showed further evidence of the fish causing the illness, and the sale of the suspected fish was stopped until complete investigation could be made.

Samples of the fish from several shipments, though all from the same pack, were obtained. Chemical test for preservatives and other poisons

the law must show that the rice is coated, and that same can be removed by washing.

Ten samples of rice were examined, three of which were uncoated and seven were coated. The labels of the coated samples did not show that the product was coated, as is required under both the State and the National laws, and the sale of these products was in violation of the law.

See results and conclusions in table below.

#### AMINATION OF RICE.

Laboratory Number.	Test for Tale.	Remarks and Conclusions.
13572	Positive....	Rice, coated with glucose and tale, and so stated on label.
13571	....do.....	Rice, coated with glucose and tale. Fact not stated on label; adulterated; sale illegal.
13570	....do.....	do.
14145	....do.....	do.
14144	....do.....	Rice, coated with glucose and tale. Statement of coating should be more prominent; sale illegal.
13569	Negative....	Rice, uncoated.
14147	....do.....	do.
14146	....do.....	do.
13568	Positive....	Rice, coated, and so stated on label.
14143	....do.....	Rice, coated with glucose and tale. Fact not stated on label; adulterated; sale illegal.

were made, but nothing was found that could have produced the trouble. As chemical tests showed nothing that could have produced the trouble, tests on living animals, cats, rats, and guinea pigs, were resorted to. It soon became evident that the fish, though they appeared to be sound, contained a deadly poison.

As it was a very serious matter, and the Department did not wish to condemn and have destroyed several hundred barrels of fish without the most positive proof that the use of same would be dangerous, the Bureau of Chemistry of the United States Department of Agriculture was asked to examine the fish also, and samples of same were sent for the purpose.

The report of the Bureau, through the Coöperative Division of same, confirmed the results obtained by this department, and advised that the fish did contain an unidentified poisonous substance, probably a protein decomposition product, which was responsible for the trouble, and

which was probably due to the fish having stood too long before being placed in the pickling brine. The report further advised that the use of the fish as food be prohibited.

The report of the United States Department completely confirming the results obtained by this Department, and it being impracticable to test each barrel, so as to separate any good that might be in the bad fish, the whole pack of fish—several hundred barrels—was condemned and the sale of same as food prohibited.

The matter was at once taken up with the packers of the fish, the Morehead City Sea Food Company, of Morehead City. Mr. C. S. Wallace, the president of the company, came to Raleigh and went, in detail, into the matter of packing the fish, and he stated most positively that the fish were not held an undue length of time before being placed in the brine and that same were packed under as clean, sanitary conditions as he had ever packed fish. He further states that the fish in question were packed in a new, clean fish house with concrete floor and plenty of clean, fresh water, while some of the same catch of fish, and from which no trouble has arisen, were packed under similar conditions, except they were packed in an old fish house which was not in as good condition as the new one referred to.

Unless some of the fish were caught at an earlier time and held by the fishermen and mixed at the bottom with a later catch, with the information in hand it is impossible to say why the fish packed at the old place were good and the fish packed at the new place were bad. As the

#### CONCLUSIONS DRAWN FROM RESULTS

Laboratory Number.	Material.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
14210	Salt Fish, Mulllets.....	Morehead City Sea Food Co., Morehead City, N. C.	C. B. Gill Co., Raleigh.....
14211	do.....	do.....	do.....
14209	do.....	do.....	do.....
14215	do.....	do.....	Dr. J. E. Griffin, Edenton.....
14208	do.....	do.....	T. L. Hunnicutt, Wakefield.....
14216	do.....	do.....	George R. Parker, Raleigh, R. F. D.
14223	do.....	do.....	Robertson & Keith, Knightdale.
14236	do.....	do.....	Hardy Hill, Kinston.....
14224	do.....	do.....	G. T. Jones, Dunn.....
14237	do.....	do.....	E. G. Griffin, Woodland.....

fish were unloaded from the boat at the old place first, coming from the top, they evidently represented the last part of the catch. As the fish packed at the new house were unloaded last, and came from the bottom of the boat, it is reasonable to suppose that they had been held longer by the fishermen before delivering them to the packers, and it is most likely that this is the reason for the fish packed at the old house being good while the fish packed at the new house, under better conditions, were bad.

Manufacturers, packers, and dealers are responsible for the condition of food products handled by them, and the packers of the bad fish are responsible for their condition, but it is to their credit that they were very active in helping to stop the sale of same, and when informed that the fish were bad beyond question, they readily and willingly consented for the fish to be destroyed.

The situation was serious; quite a few people had been made very ill, and probably a death or two had been caused by the fish, though at first there was no very positive proof of it. Had the Department and the packers of the fish not acted promptly in stopping the sale of same, it is likely that much illness would have been produced and many deaths would have occurred.

(With gratitude this Department acknowledges the assistance rendered in this matter by the Bureau of Chemistry, United States Department of Agriculture, through the Coöperative Division of the same.)

See conclusions in table below.

#### OF EXAMINATION OF SALT FISH.

Laboratory Number.	Conclusions.
14210	Salt fish; bad. Contained a deadly poisonous substance which appeared to be a protein decomposition product.
14211	do.
14209	Salt fish. Contained no poisonous substance.
14215	Salt fish; bad. Contained deadly poisonous substance which appeared to be a protein decomposition product.
14208	do.
14216	Salt fish. Contained no poisonous substance.
14223	Salt fish; bad. Contained a deadly poisonous substance which appeared to be a protein decomposition product.
14236	do.
14224	do.
14237	do.

## SWEET OIL AND SWEET OIL SUBSTITUTES.

Sweet oil is olive oil. Any oil other than olive oil branded sweet oil would be misbranded. It is not correct to label cotton-seed oil sweet oil, and elsewhere on the label describe the true character of the oil.

There seems to have been a difference of opinion as to what constitutes sweet oil. The Department in 1911 made an investigation of the subject and found that the only oil to which the term "sweet oil" may be correctly applied is olive oil. The United States Department of Agriculture in food inspection decision No. 139 has since that time held

## RESULTS OF THE EXAMINATION OF SWEET

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13512	Keller's Sweet Oil, No. 10.....	Carr, Owens & Co., Baltimore, Md..	E. A. Williams, Battleboro...
14105	Dill's Celebrated Sweet Oil, Pure Olive.	Dill Medicine Co., Norristown, Pa..	Kings Mountain Grocery Co., Kings Mountain.
13520	Gilbert's No. 7 Olive Sweet Oil..	Gilbert Bros. & Co., Baltimore, Md.	L. W. Parker, Mount Olive...
13511	Gilbert's No. 10 Sweet Oil.....	do.....	H. C. Joyner, Rocky Mount..
12899	Sweet Oil, Olive, Gilbert's No. 10.	do.....	Klein Bros., Morehead City..
12900	do.....	do.....	Walter Credle & Co., Wash- ington.
12901	Sweet Oil, Olive, Gilbert's No. 7	do.....	do.....
12903	Sweet Oil, Gilbert's No. 10.....	do.....	Gideon Pendleton, Elizabeth City.
12909	Sweet Oil, Gilbert's Olive No. 10	do.....	J. H. Harris, Farmville.....
12910	do.....	do.....	J. B. Pierce Co., Ayden.....
12898	Sweet Oil, "Red Cross".....	Interstate Commerce Co., Balti- more, Md.	Spence & Vinson, Goldsboro..
13510	Sweet Oil, McNeal's Standard..	Kent Drug Co., Baltimore, Md....	W. T. Buchanan, Sanford....
13509	Sweet Oil.....	W. H. King Drug Co., Raleigh, N. C.	Ashley Horne & Son, Clayton
14107	Sweet Olive Oil, Reliable.....	McCormick & Co., Baltimore, Md..	Shipman Bros., Henderson- ville.
14104	Sweet Oil, Absolutely Pure, Reliable.	do.....	M. T. Parham & Co., Gas- tonia.
13516	Sweet Oil, McCormick's Reli- able.	do.....	J. H. & W. F. Low, Greens- boro.
13513	Sweet Oil, for Technical Use...	Owens & Minor Drug Co., Rich- mond, Va.	W. E. Edwards & Son, Battle- boro.
13515	Sweet Oil, Peabody's.....	Peabody Drug Co., Durham, N. C..	Peabody Drug Co., Durham..
14103	Sweet Oil, N. P. D.....	Norman-Perry Drug Co., Winston- Salem, N. C.	.....
13522	Sweet Oil.....	John M. Scott & Co., Charlotte, N. C.	Curry-Patterson Co., Maxton.
12902	Sweet Oil, Standard.....	Standard Drug Co., Elizabeth City, N. C.	F. G. Terrell, Belhaven.....
12904	do.....	do.....	R. B. White, Elizabeth City..
12906	Sweet Oil.....	Terry-Taylor Drug Co., Norfolk, Va.	C. W. Stevens & Co., Eliza- beth City.

that any oil other than olive oil is misbranded when sold under the name "Sweet Oil," and it is not correct to label cotton-seed oil as "sweet oil" and then elsewhere place on the label words to describe the true character of the oil.

This department does not wish to in any way discriminate against cotton-seed oil, for it is a good food product and justly deserves the good name it bears; but it is not sweet oil and cannot be legally sold as such.

The results of the examination of the 29 samples examined this year are published in the table below.

## OIL AND SWEET OIL SUBSTITUTES.

Laboratory Number.	Halphen's Test for Cotton-seed Oil.	Baudouin Test for Sesame Oil.	Reading Refractometer, 15.5° C.	Refractive Index.	Specific Gravity, 15.5° C.	Remarks and Conclusions.
13512	Negative.....		69.8	1.4721		Sweet oil.
14105	do.....		68.0	1.4710	0.91563	do.
13520	do.....		67.9	1.4710		do.
13511	do.....		69.8	1.4721		do.
12899	do.....	Negative.	63.0	1.4678	0.91193	do.
12900	do.....	do.....	64.0	1.4685		do.
12901	do.....	do.....	63.0	1.4678		do.
12903	do.....	do.....	63.0	1.4678		do.
12909	do.....	do.....	63.0	1.4678		do.
12910	do.....	do.....	64.0	1.4685		do.
12898	Positive.....	do.....	70.0	1.4723		Cotton-seed oil, misbranded. Was branded sweet oil; sale illegal.
13510	Negative.....		69.0	1.4717		Sweet oil.
13509	Positive.....		76.0	1.4579		Cotton-seed oil, misbranded. Was branded sweet oil; sale illegal.
14107	Negative.....		68.0	1.4710	0.91425	Sweet oil.
14104	do.....		68.0	1.4710		do.
13516	do.....		69.2	1.4718		do.
13513	Positive.....		75.9	1.4759		Cotton-seed oil, branded sweet oil; misbranded; sale illegal.
13515	do.....		75.2	1.4754		Cotton-seed oil, misbranded. Was branded sweet oil; sale illegal.
14103	do.....		74.0	1.4774	0.92184	do.
13522	Negative.....		68.9	1.4716		Sweet oil.
12902	do.....	Negative.	64.0	1.4685		do.
12904	do.....	do.....	64.0	1.4685		do.
12906	Positive.....	do.....	70.0	1.4723		Cotton-seed oil, misbranded. Was branded sweet oil; sale was illegal.

## RESULTS OF THE EXAMINATION OF SWEET

Laboratory Number.	Material and Brand from Label.	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
12905	Sweet Oil, Cold Pressed, Pure...	Terry-Taylor Drug Co., Norfolk, Va.	C. W. Stevens & Co., Elizabeth City.
13518	Sweet Oil.....	P. A. Thompson, Winston-Salem, N. C.	P. A. Thompson, Winston-Salem.
13519	Sweet Oil, Pure, Our Seal.....	Vaughn-Crutchfield Co., Winston-Salem, N. C.	Meador Supply Co., Madison.
14106	...do.....	...do.....	J. T. Angell, Mocksville.....
12908	Sweet Oil.....	Williams & Tynes, Norfolk, Va.....	L. S. Landing, Plymouth.....
12907	Sweet Oil, Strictly Pure.....	Williams, Martin & Gray, Norfolk, Va.	W. S. Blanchard & Son, Hartford.

## VANILLA EXTRACTS AND VANILLA EXTRACT SUBSTITUTES.

## DEFINITIONS AND STANDARDS.

Vanilla extract is the flavoring extract prepared from vanilla bean, with or without sugar or glycerin, and contains in one hundred cubic centimeters (100 cc.) the soluble matters from not less than ten (10) grams of the vanilla bean.

The adulterants of vanilla extract are tonka bean extract, artificial vanillin, artificial coumarin, caramel and coal-tar colors. Artificial vanillin is the same as the chief flavoring principle of the vanilla bean, but the extract made from this substance lacks the flavor of genuine

## RESULTS OF THE EXAMINATION OF VANILLA

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13188	Vanilla Extract, A. & P.	Vanilla Extract.	Atlantic and Pacific Tea Co., Jersey City, N. J.	A. & P. Tea Co., Greensboro.
14161	Vanilla Substitute...	Vanilla Substitute.	Austin-Nichols Co., New York, N. Y.	H. O. Mattox, Dunn.....
13178	Vanilla Extract, Pure Food, Sunbeam.	Vanilla Extract.	...do.....	B. G. Hicks, Louisburg....
13232	Vanilla Guaranteed...	...do.....	Robert R. Bellamy, Wilmington, N. C.	Henry Wentzensen, Wilmington.
14153	Vanilla.....	Vanilla Extract.	Robert R. Bellamy, Wilmington, N. C.	R. L. Burton, Wilmington .
14168	Vanilla Flavoring, Brame's Compound.	Vanilla Flavoring Compound.	Brame Drug Co., North Wilkesboro, N. C.	Brame Drug Co., North Wilkesboro.
13185	Vanilla Extract, Peacock Brand.	Vanilla Extract.	Bristol Drug Co., Bristol, Va.-Tenn.	The Atkinson Co., Elkin...
14180	Vanilla Extract, Compound.	Vanilla Extract, Compound.	Burwell & Dunn Co., Charlotte, N. C.	Bradford Grocery and Produce Co., Statesville.

OIL AND SWEET OIL SUBSTITUTES—*Continued.*

Laboratory Number.	Halphen's Test for Cotton-seed Oil.	Baudouin Test for Sesame Oil.	Reading Refractometer, 15.5° C.	Refractive Index.	Specific Gravity, 15.5° C.	Remarks and Conclusions.
12905	Negative....	Negative	78.0	1.4771	.....	Not sweet oil, but was so branded and was sold as sweet oil; sale was illegal.
13518	Positive....	.....	74.4	1.4749	.....	Cotton-seed oil, misbranded. Was branded sweet oil; sale illegal.
13519	....do.....	.....	74.4	1.4749	.....	do.
14106	....do.....	.....	74.0	1.4747	0.92209	do.
12908	....do.....	Negative	70.0	1.4723	.....	do.
12907	Negative....	....do....	64.0	1.4685	.....	Sweet oil.

vanilla extract, owing to the absence of other substances, which cannot be successfully imitated. Tonka beans are much cheaper than vanilla beans and have a ranker and more stringent flavor, due to coumarin, which is also prepared artificially for use in extracts.

The results of the examination of 64 samples are reported in the table below, and by reference to same the character of the adulteration and misbranding can be seen without repeating it here.

Many of the samples were sold in violation of the law, notwithstanding the dealers have been repeatedly cautioned about this and similar violations.

## EXTRACTS AND VANILLA EXTRACT SUBSTITUTES.

Laboratory Number.	Total Solids—Per Cent.	Ash—Per Cent.	Lead Number, Normal (Winton).	Vanillin—Per Cent.	Coumarin.	Specific Gravity, 15.6° C.	Remarks and Conclusions.
13188	12.30	.....	0.82	0.262	Negative...	0.9945	Vanilla extract.
14161	12.33	0.07	0.17	.....	Positive....	1.0410	Vanilla extract, compound.
13178	19.20	0.23	0.56	0.200	Negative...	1.0168	Vanilla extract.
13232	21.80	.....	.....	.....	Positive....	1.0697	Vanilla extract, compound. Was branded vanilla extract; misbranded; sale illegal.
14153	22.50	.....	0.17	.....	....do.....	1.0770	Compound vanilla extract; misbranded; sale illegal.
14168	12.77	0.05	0.09	.....	....do.....	1.0557	Vanilla extract, compound; adulterated; misbranded; sale illegal.
13185	16.10	.....	0.67	0.299	Negative...	1.0167	Vanilla extract.
14180	8.98	.....	0.42	0.110	Positive....	1.0096	Vanilla extract, compound.

## RESULTS OF THE EXAMINATION OF VANILLA EX

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
14159	Vanilla Extract, (26) Chamberlain's.	Vanilla Extract.	Chamberlain's Medicine Co., Des Moines, Iowa.	J. E. Webb, Shelby.....
13180	Vanilla Extract, Pure Concentrated.	do.....	William M. Chappelear & Sons, Zanesville, O.	W. A. Whitaker, Apex.....
13187	Vanilla Extract, White House Brand	do.....	Concord Chemical Co., Baltimore, Md.	Miller Grocery Co., North Wilkesboro.
14155	Windsor Brand.....	do.....	Cumberland Mfg. Co., Nashville, Tenn.	Southern Grocery Co., Wilmington.
14179	.....	do.....	F. L. Daggett Co., Boston, Mass.	Peoples Drug Co., Salisbury.
14157	Vanilla Extract, Dill's Pure.	do.....	The Dill Medicine Co., Norristown, Pa.	W. H. Dellinger, Gastonia..
14166	Vanilla Extract, Dill's Absolutely Pure.	do.....	do.....	Carolina Warehouse, Greensboro.
14160	Vanilla Extract, Dill's.	do.....	do.....	Kings Mountain Grocery Co., Kings Mountain.
14156	Vanilla Substitute, Dill's.	Vanilla Extract Substitute.	do.....	B. T. Barker & Co., Gastonia.
13175	Vanilla Flavor, Compound, Dr. Fenner's Imitation.	Vanilla Extract, Imitation.	M. M. Fenner Co., Fredonia, N. Y.	S. Meyer, Enfield.....
12926	Vanilla Extract, Fonerden's Highest Grade.	Vanilla Extract.	C. O. Fonerden & Co., Baltimore, Md.	Spence & Vinson, Goldsboro
12932	Vanilla Extract, Golden Horse Shoe Brand.	do.....	The Four Company, Norfolk, Va.	L. S. Landing, Plymouth...
14151	Dove Brand.....	do.....	The Frank Tea and Spice Co., Cincinnati, Ohio.	Hardy Hill, Kinston.....
13190	Vanilla Extract.....	do.....	Greensboro Drug Co., Greensboro, N. C.	Greensboro Drug Co., Greensboro, N. C.
13235	Vanilla Extract, Pure, Blue Ribbon Brand.	do.....	Greever-Lotspeich Mfg. Co., Knoxville, Tenn.	S. H. Youngblood, Charlotte.
13231	.....	do.....	do.....	R. A. Montgomery, Wilmington.
13189	Vanilla Extract (U. S. P.), Alcohol 61%.	do.....	Grissom-Sikes Drug Co., Greensboro, N. C.	Grissom-Sikes Drug Co., Greensboro.
13174	Vanilla Extract, Heekin's Deer Head.	do.....	Heekin Spice Co., Cincinnati, O.	Cummings Grocery Co., Tarboro.
14170	Vanilla Extract, Heekin's White Cap.	do.....	do.....	J. R. Cummings, Winston-Salem.
14174	Vanilla Extract, Pure, Hite's.	do.....	S. P. Hite Co., Roanoke, Va....	Shipman Bros., Hendersonville.
13193	Vanilla Extract, Kitchen Queen.	do.....	Interstate Chemical Co., Baltimore, Md.	Madison Grocery Co., Madison.
13179	do.....	do.....	do.....	T. A. Addison, East Durham.
14165	Vanilla Extract, Old Dominion.	do.....	Interstate Commerce Co., Richmond, Va.	M. S. Jeffreys, Greensboro.
13169	do.....	do.....	do.....	Champion Bros., Clayton.
12927	Vanilla Extract, Pure, Old Dominion.	do.....	do.....	J. S. Derr, Goldsboro.....

TRACTS AND VANILLA EXTRACT SUBSTITUTES—*Continued.*

Laboratory Number.	Total Solids—Per Cent.	Ash—Per Cent.	Lead Number, Normal (Winon).	Vanillin—Per Cent.	Coumarin.	Specific Gravity, 15.6° C.	Remarks and Conclusions.
14159	22.10	-----	0.45	0.190	Negative	1.0199	Vanilla extract.
13180	37.40	-----	0.20	0.516	do	1.1273	Vanilla extract, compound; misbranded; sale illegal.
13187	28.50	-----	0.12	0.321	Positive, 0.083%	1.0997	Vanilla extract, compound; adulterated; misbranded; sale illegal.
14155	7.82	0.37	-----	-----	Negative	0.9738	Vanilla extract, below standard; adulterated; sale illegal.
14179	14.10	0.41	0.51	0.210	do	0.9743	Vanilla extract.
14157	-----	-----	0.57	0.110	do	0.9580	do.
14166	-----	0.57	0.60	0.110	do	0.9519	do.
14160	8.13	-----	0.72	0.210	do	0.9650	do.
14156	15.11	0.03	-----	-----	Positive	1.0381	Extract vanilla, imitation.
13175	-----	-----	-----	-----	do	-----	Extract vanilla, imitation, colored with caramel.
12926	25.94	0.22	0.39	0.100	Negative	-----	Vanilla extract.
12932	14.37	0.24	0.57	0.110	do	-----	do.
14151	18.52	0.38	-----	-----	do	1.0170	do.
13190	17.50	-----	0.15	0.242	Positive, 0.168%	1.0346	Vanilla extract, compound; adulterated; misbranded; sale illegal.
13235	16.80	-----	-----	-----	Negative	1.0098	Vanilla extract.
13231	19.60	-----	0.70	0.298	do	1.0098	do.
13189	13.90	-----	0.18	0.336	Positive, 0.065%	1.0275	Vanilla extract, compound; adulterated; misbranded; sale illegal.
13174	21.80	0.14	0.46	0.222	Negative	1.0298	Vanilla extract.
14470	25.10	0.47	0.52	0.160	do	1.0264	do.
14174	24.34	0.49	0.65	0.470	do	1.0245	do.
13193	35.20	-----	0.93	0.400	do	1.1156	do.
13179	32.00	0.40	0.70	0.400	do	1.1156	do.
14165	23.81	0.33	0.43	0.220	do	1.0660	do.
13169	17.80	0.12	0.67	0.424	do	1.0176	do.
12927	15.47	0.20	0.30	0.150	do	-----	do.

## RESULTS OF THE EXAMINATION OF VANILLA EX

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
14154	Old Dominion Brand	Vanilla extract.	Interstate Commerce Co., Richmond, Va.	E. L. Starkey, Wilmington.
13170	Vanilla Extract, I. C. ....do.....	.....do.....	.....do.....	Wallace Grocery, Smithfield
13183	Vanilla Extract.....do.....	.....do.....	C. E. King & Sons, Durham, N. C.	C. E. King & Sons, Durham
14171	Vanilla Flavor, Dilute, Star Brand.	Vanilla Flavor, Dilute.	Knoxville Drug Co., Knox- ville, Tenn.	N. C. Christopher, Murphy
14164	Vanilla Extract.....do.....	Vanilla Extract.	T. C. McIlheney, Greensboro, N. C.	Troxler Bros., Greensboro..
14152	High Proof Brand....do.....	Vanilla Substi- tute.	Miller Mfg. Co., New York, N. Y.	E. B. Hackburn, New Bern.
14162	Vanilla Extract, Pure, Newton's Red Seal.	Vanilla Extract.	Newton Tea and Spice Co., Cincinnati, Ohio.	R. J. Wheeler, Dunn.....
12929	Vanilla Extract.....do.....	.....do.....	.....do.....	W. Gray Willis, Washington
13176	Vanilla Extract, Owens & Minor's.	.....do.....	Owens & Minor Drug Co., Richmond, Va.	M. C. Braswell, Battleboro.
13172	Vanilla Extract, Parke's Choice.	Vanilla Extract, Pure.	L. H. Parke Co., Philadelphia, Pa.	N. J. Bell, Fayetteville.....
13184	Vanilla Extract, Peabody's.	Vanilla Extract.	Peabody Drug Co., Durham, N. C.	Peabody Drug Co., Dur- ham.
14158	Vanilla Extract, Pure, Votan Brand.	.....do.....	Reiley-Taylor Co., New Orleans, La.	Roberts Grocery Co., Shelby.
13182	Vanilla Extract, Souder's.	.....do.....	The Royal Remedy and Ex- tract Co., Dayton, Ohio.	W. O. Whitaker, Apex.....
14169	Vanilla Compound Flavor, Sampson Br'd, Full Strength.	Vanilla Flavor, Compound.	Sampson Medicine Co., Win- ston-Salem, N. C.	Sampson Medicine Co., Winston-Salem.
14172	Vanilla Extract, Pure, Hart's.	Vanilla Extract.	Sanford, Chamberlain & Al- bers Co., Knoxville, Tenn.	S. A. DeHart & Co., Bry- son City.
14173	Vanilla Extract, Sauers' Pure Con- centrated.	.....do.....	C. E. Sauers Co., Richmond, Va.	H. M. Flynn, Henderson- ville.
14167	Vanilla Flavoring, Pure, (S) Scott's.	.....do.....	John M. Scott & Co., Charlotte, N. C.	J. L. Clement, Mocksville..
13233	Vanilla Extract, Scott's (S) Pure Flavoring.	.....do.....	.....do.....	Curry-Patterson Co., Max- ton.
14150	Spartan Brand.....do.....	.....do.....	Southern Chemical Co., Petersburg, Va.	Hardy Hill, Kinston.....
12928	Vanilla Extract, Old Homestead.	.....do.....	Southern Drug Co., Norfolk, Va.	James W. Cole, Goldsboro..
13191	Vanilla Extract, 61% Alcohol.	.....do.....	Still Drug Co., Greensboro, N. C.	Still Drug Co., Greensboro.
13171	Vanilla Flavor, Imita- tion, Red Bird.	Vanilla Flavor.	Suffolk Drug Corporation, Suffolk, Va.	R. F. Jernigan, Dunn.....
13186	Vanilla Extract, Compound.	Vanilla Extract.	Surry Drug Co., Elkin, N. C.	Surry Drug Co., Elkin.....
13181	Vanilla Extract, Darfield's Old Homestead Brand.	.....do.....	Swanson Drug Co., Chicago, Ill.	W. O. Whitaker, Apex.....
14163	Eagle Brand.....do.....	.....do.....	Webb Mfg. Co., Nashville, Tenn.	W. H. Dailey, Greensboro..
13192	Vanilla Extract, Pure.	Vanilla Extract, Pure.	Welfares Drug Store, Winston- Salem, N. C.	Welfares Drug Store, Winston-Salem.

TRACTS AND VANILLA EXTRACT SUBSTITUTES—*Continued.*

Laboratory Number.	Total Solids—Per Cent.	Ash—Per Cent.	Lead Number, Normal (Wincon).	Vanillin—Per Cent.	Coumarin.	Specific Gravity, 15.6° C.	Remarks and Conclusions.
14154	23.03	-----	-----	-----	Negative...	1.0438	Vanilla extract.
13170	19.10	-----	0.58	0.392	...do....	1.0307	do.
13183	14.70	-----	-----	-----	Positive...	0.9814	Vanilla extract, compound; misbranded; sale illegal.
14171	8.90	0.37	0.38	0.320	Negative...	0.9699	Vanilla extract.
14164	16.14	0.12	0.15	0.320	Positive....	1.0355	Vanilla extract, compound; adulterated; misbranded; sale illegal.
14152	13.55	0.11	-----	-----	...do....	-----	Compound vanilla extract.
14162	23.55	-----	0.87	0.210	Negative...	1.4390	Vanilla extract.
12929	20.96	0.23	0.55	0.130	...do....	-----	do.
13176	22.50	0.19	0.81	0.228	...do....	1.0368	do.
13172	20.90	0.15	0.50	-----	...do....	1.0407	do.
13184	16.10	-----	0.24	0.620	Positive, 0.246%	1.0371	Vanilla extract, compound; adulterated; misbranded; sale illegal.
14158	16.28	-----	0.60	0.100	Negative...	1.0067	Vanilla extract.
13182	18.10	-----	0.61	-----	...do....	1.0319	Vanilla extract.
14169	31.07	0.21	0.18	-----	Positive....	1.1026	Vanilla extract, compound.
14172	-----	0.36	0.45	0.320	Negative...	0.9873	Vanilla extract.
14173	20.81	0.34	0.53	0.360	...do....	1.0307	do.
14167	-----	0.20	0.48	-----	...do....	0.9826	do.
13233	15.50	-----	0.14	0.174	...do....	0.9973	Vanilla extract, below standard; adulterated; misbranded; sale illegal.
14150	20.37	-----	0.42	0.090	...do....	1.0331	Vanilla extract.
12928	24.33	0.08	0.19	0.300	Positive....	-----	Vanilla extract, compound; misbranded; sale illegal.
13191	-----	-----	0.17	0.273	...do....	1.0722	Vanilla extract, compound; adulterated; misbranded; sale illegal.
13171	-----	-----	-----	-----	...do....	-----	Imitation vanilla extract; misbranded; sale illegal.
13186	17.00	-----	-----	-----	...do....	1.0191	Extract vanilla, compound.
13181	13.60	-----	0.44	0.238	Negative...	1.0110	Vanilla extract, and not vanilla as branded; vanilla is the ground bean.
14163	-----	0.23	0.38	0.190	...do....	0.9869	Vanilla extract
13192	14.30	-----	0.44	-----	...do....	1.0090	do.

## RESULTS OF THE EXAMINATION OF VANILLA EX

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
11724	Vanilla Extract, We-Li-Ka.	Vanilla Extract.	We-Li-Ka Mfg. Co., Memphis, Tenn.	J. F. Powell, Fayetteville...
13230	Vanilla, Pure, Witsell's New Flavoring.	...do.....	do.....	Hanover Grocery Co., Wilmington.
12931	Vanilla, Pure Fruit Flavor, Witsell's.	Vanilla.....	do.....	C. W. Stevens & Co., Elizabeth City.
12930	Vanilla Extract, Artificially Colored.	Vanilla Extract.	Williams, Martin & Gray, Norfolk, Va.	U. W. Tarkington, Belhaven
13234	Vanilla Flavor, Artificial.	Vanilla Extract, Artificial.	Winston Drug Co., Winston-Salem, N. C.	V. F. Tarlton, Wadesboro...

## VINEGAR AND VINEGAR SUBSTITUTES.

## VINEGAR STANDARDS.

Vinegar in the product made by the alcoholic and subsequent acetous fermentation of the juice of apples, and contains not less than 4.00 per cent of acetic acid, not less than 1.60 per cent of apple solids, of which not more than 50.00 per cent are reducing sugars, and not less than 0.25 per cent of apple ash.

Wine vinegar is the product made by the alcoholic and subsequent acetous fermentation of the juice of grapes, and contains not less than 4.00 per cent of acetic acid, not less than 1.00 per cent of grape solids, and not less than 0.13 per cent of grape ash.

Malt vinegar is the product made by the alcoholic and subsequent acetous fermentation, without distillation, of an infusion of barley malt or cereals whose starch has been converted by malt, is dextro-rotatory, and contains not less than 4.00 per cent of acetic acid, not less than 2.00 per cent of solids, and not less than 0.2 per cent of ash.

Spirit vinegar is the product made by the acetous fermentation of dilute distilled alcohol, and contains not less than 4.00 per cent acetic acid.

Under both the State and National Food Laws vinegar is a product of standard strength made from the juice of apples—that is vinegar, and nothing else is vinegar, and nothing else can be legally sold simply as vinegar. A 4 per cent solution of acetic acid in water, colored with caramel, is not vinegar and cannot be legally sold as such. It has the

TRACTS AND VANILLA EXTRACT SUBSTITUTES—*Continued.*

Laboratory Number.	Total Solids—Per Cent.	Ash—Per Cent.	Lead Number, Normal (Winton).	Vanillin—Per Cent.	Coumarin.	Specific Gravity, 15.6° C.	Remarks and Conclusions.
11724	10.37	.27	0.48	.150	Negative...	0.9889	Vanilla extract.
13230	53.50	-----	0.77	.380	...do-----	1.1485	do.
12931	57.76	.42	0.76	.260	...do-----		Vanilla extract substitute.
12930	7.67	.18	0.25	.030	...do-----		Vanilla extract, below standard; adulterated; misbranded; sale illegal.
13234	35.50	-----			Positive-----	1.1276	Imitation vanilla extract.

acid strength of vinegar, to be sure, but instead of having the delightful flavor and odor, so desirable in vinegar, it has nothing but a pungent, stinging odor and taste. So-called spirit vinegar is practically nothing but acetic acid in water, colored with caramel. Still, manufacturers and dealers want to sell it as vinegar. They also want to mix it in all proportions from 20 to 90 per cent, with vinegar and sell this mixture as vinegar.

The most frequent violation of the food law to-day is the sale of these so-called vinegars as vinegar by the retail dealers of the State. If the manufacturers or jobbers were to ship these products, labeled vinegar, from one State into another they would be prosecuted under the National law.

These products, shipped in barrels, are not often labeled or branded vinegar, but are labeled what they are, though many dealers in selling them at retail sell them as vinegar. When a sample of so-called vinegar is bought by an inspector as *vinegar*, and the dealer is notified that he has violated the food law in the sale of a product as vinegar which was not vinegar, he almost invariably replies that he thought it was vinegar. Had he looked at the label he would have seen that it was not vinegar.

During the year 311 samples of vinegar and so-called vinegar have been purchased from the dealers of the State and examined. The results of the examination of these samples are tabulated below.

Dealers are cautioned that the sale of so-called vinegar or adulterated vinegar as vinegar will be prosecuted.

## RESULTS OF THE EXAMINATION OF VINE

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13010	Vinegar, Madison, Imitation.	Vinegar, Imitation.	Alart & McGuire Co., New York, N. Y.	W. H. Hines, Wilmington....
14078	-----	Vinegar-----	Albain Grocery Co., Gastonia, N. C.	B. T. Barker & Co., Gastonia.
14077	-----	do-----	-----	Allen & Co., Mount Airy....
13016	-----	do-----	American Fruit Products Co., Rochester, N. Y.	Mrs. L. Freimuth, Wilmington.
13008	-----	Vinegar, Cider.	do-----	Charles Rickert, Wilmington.
13386	-----	Vinegar-----	American Commission Co., Greensboro, N. C.	W. T. Sockwell, Greensboro..
13002	Albemarle Apple Vinegar.	do-----	Antrim, C. W., & Sons, Richmond, Va.	Herrin & Bass, Clinton.....
14010	-----	do-----	do-----	McK. Kincaid, Morganton....
14019	Albemarle Brand	do-----	do-----	J. A. Branch, Lumberton....
12873	-----	do-----	Austin-Nichols Co., New York, N. Y.	J. C. Spruill, Plymouth.....
12863	"Monarch" Pure Apple Vinegar.	do-----	do-----	G. W. Twiddy, Elizabeth City.
13048	-----	Vinegar, "Monarch."	do-----	Davis & Byerly, Charlotte...
13324	Sunbeam, Pure Food, Cider Vinegar.	Vinegar-----	do-----	C. B. Keech & Co., Tarboro..
13325	do-----	do-----	do-----	do-----
12862	Vinegar, Distilled Imitation.	do-----	Baltimore Mfg. Co., Baltimore, Md.	T. J. Raynor, Elizabeth City
12865	"Premier" Apple Cider Vinegar.	do-----	do-----	C. W. Stevens Co., Elizabeth City.
13393	Vinegar, Distilled Spirit, Colored.	do-----	do-----	J. H. Weisner & Co., Winston-Salem.
12840	Vinegar, Distilled Spirit.	do-----	do-----	B. B. Davenport, New Bern..
13378	-----	do-----	-----	Barlard & Ford, Reidsville...
14014	-----	do-----	Bear, Samuel, Sr., & Sons, Wilmington, N. C.	J. N. Richardson, Wilmington
13020	Vinegar, Beech Nut	Vinegar, Apple.	Beech Nut Packing Co., Canajoharie, N. Y.	The McKinnon Co., Maxton...
13929	-----	Vinegar-----	-----	A. Blanton Grocery Co., Shelby, N. C.
14011	-----	do-----	Blanton, A., Grocery Co., Marion, N. C.	A. L. Finley, Marion.....
13015	Vinegar, "Mount Vernon."	do-----	Board, Armstrong & Co., Alexandria, Va.	L. L. Shepherd, Wilmington..
12833	Vinegar, Pure Apple.	do-----	Borden & Somberger, Fairport, N. Y.	Needham Willis, Morehead City.
14053	-----	do-----	-----	Bodenheimer Bros., Waughtown.
12834	-----	do-----	Bentley, Shiver & Co., Baltimore, Md.	J. B. Jones & Son, Beaufort...
14018	-----	do-----	Boushee, Ed., Wilmington, N. C.	B. B. Humphreys, Wilmington.
13011	-----	do-----	do-----	Palace Market, Wilmington...
13009	-----	do-----	do-----	D. F. Toler, Wilmington.....

## GAR AND SUBSTITUTES FOR VINEGAR.

Laboratory Number.	Acidity, Total— Per Cent.	Solid Matter in Solution— Per Cent.	Ash—Per Cent.	Total Sugars— Per Cent.	Non-sugar Solids— Per Cent.	Remarks and Conclusions.
13010.	4.72	0.22	-----	-----	-----	Imitation vinegar.
14078	4.25	0.28	-----	-----	-----	Spirit vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
14077	3.90	0.38	0.05	0.28	0.10	Spirit vinegar, sold by dealer as vinegar; misrepresented; sale illegal.
13016	5.10	3.38	-----	0.97	2.41	Vinegar.
13008	4.70	3.13	-----	-----	-----	do.
13386	4.55	2.32	-----	-----	-----	do.
13002	4.66	3.19	0.42	0.85	2.34	do.
14010	4.44	2.12	-----	-----	-----	do.
14019	4.56	2.73	-----	-----	-----	do.
12873	6.14	1.50	0.29	-----	0.92	Vinegar slightly below standard in apple solids.
12863	4.42	1.59	-----	-----	-----	Vinegar.
13048	4.26	1.86	-----	-----	-----	do.
13324	4.45	2.26	-----	-----	-----	do.
13325	4.10	1.96	-----	-----	-----	do.
12862	4.72	0.22	-----	-----	-----	Spirit vinegar, sold as vinegar; barrel labeled imitation vinegar; misrepresented; sale illegal.
12865	3.96	2.18	-----	-----	-----	Vinegar, slightly below standard; reduced with water.
13393	4.05	0.19	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
12840	4.40	0.27	-----	-----	-----	do.
13378	4.10	1.78	-----	-----	-----	Vinegar.
14014	4.80	2.44	-----	-----	-----	do.
13020	5.00	2.63	-----	-----	-----	do.
13929	4.20	0.23	1.39	-----	-----	Compound vinegar, or vinegar to which water only had been added; not straight standard vinegar.
14011	4.64	0.45	-----	-----	-----	Spirit vinegar, sold by dealer as vinegar; misrepresented; sale illegal.
13015	4.24	0.15	-----	-----	-----	Spirit vinegar, misbranded; branded vinegar; explanation does not excuse misbranding; sale illegal.
12833	4.16	3.45	0.50	0.96	2.40	Vinegar.
14053	4.35	0.31	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
12834	4.48	1.60	0.24	-----	-----	Vinegar.
14018	4.36	2.13	-----	-----	-----	do.
13011	5.10	2.62	-----	-----	-----	do.
13009	4.26	2.56	-----	-----	-----	do.

## RESULTS OF THE EXAMINATION OF VINEGAR

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13047		Vinegar		Boyd-Garner Co., Charlotte.
13317		do	Boykin Grocery Co., Wilson, N. C.	Ruffin-High Co., Wilson
14062		do		John F. Brietz, Winston-Salem.
13022		do		E. L. Burns, Maxton
14028		do		J. H. Burton, Reidsville
14033		do		Carolina Warehouse, Greensboro.
12822		do		Stephen Carraway, Kinston
12861		do		W. H. Cartwright, Elizabeth City.
13954		Vinegar, Grape		Elias Carr, Raleigh
14119	Vinegar, Family	Vinegar	Sol Caslar, Asheville, N. C.	John H. Jenkins, Asheville
14120	Vinegar, Apple	do	do	W. L. Barrett, Asheville
14117	do	do	do	E. S. Harrold, Waynesville
14045		Vinegar, Apple		City Grocery Co., Madison
14039		do		J. L. Clement, Mocksville
12821		Vinegar	L. A. Cobb & Co., Kinston, N. C.	W. H. Murphy, Kinston
12826		do	do	Stroud Bros., Kinston
14121	Vinegar, Pure Apple.	do	Coca-Cola Bottling Co., Asheville, N. C.	Shipman Bros., Hendersonville.
14118	do	do	do	Waynesville Grocery Co., Waynesville.
14116	do	Vinegar, Apple	do	Marr-Coburn Co., Bryson City.
13355	Vinegar, Uncle Josh	Vinegar, Compound.	Consolidated Cider and Vinegar Co., Memphis, Tenn.	O. K. Grocery Co., Durham
13030		Vinegar		E. M. Covington & Co., Rockingham.
13389		do	Cramer Bros., Winston-Salem, N. C.	E. P. Hertman, Winston-Salem.
14041		do	do	J. N. Young, Walnut Cove
14068		do	do	W. F. Grubbs, Winston-Salem
12882		Vinegar, Apple		Dail & Halton, Ayden
13323		Vinegar		C. M. Dancy, Tarboro
14043		do		Dodson & Co., Walnut Cove
13322		do		Nathan Edmondson, Tarboro
14049		do		Elkin Mercantile Co., Elkin
12855		do	James Ellis & Co., Washington, N. C.	J. H. Jarvis, Washington
14061		do		H. E. Faircloth, Winston-Salem.
13028		do	Fleming & Christian, Richmond, Va.	Watson-King Co., Rockingham.
13027		do	do	E. D. Whitlock Rockingham
12872	Vinegar, Golden Horse Shoe, Apple	do	The Four Company, Norfolk, Va.	Plymouth Supply Co., Plymouth.
12812		do	do	S. R. Odom, Goldsboro
13328		do	do	W. G. Bass, Halifax
13303		do	L. M. Foushee, Jonesboro, N. C.	W. G. Dean, Red Springs

AND SUBSTITUTES FOR VINEGAR—*Continued.*

Laboratory Number.	Acidity, Total—Per Cent.	Solid Matter in Solution—Per Cent.	Ash—Per Cent.	Total Sugars—Per Cent.	Non-sugar Solids—Per Cent.	Remarks and Conclusions.
13047	5.46	2.34	-----	-----	-----	Vinegar.
13317	4.25	2.43	-----	-----	-----	do.
14062	5.60	0.66	0.24	.18	.51	do.
13022	5.16	0.53	-----	-----	-----	Compound vinegar; sold as vinegar; misrepresented; sale illegal.
14028	4.66	1.89	-----	-----	-----	Vinegar.
14033	2.92	1.54	-----	-----	-----	Product sold as vinegar, below standard; adulterated; sale was illegal.
12822	4.60	0.51	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
12861	6.02	0.63	-----	-----	-----	do.
13954	4.46	-----	-----	-----	-----	Grape vinegar.
14119	4.70	0.14	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
14120	4.00	2.22	0.40	0.70	1.58	Vinegar.
14117	3.95	2.04	0.32	0.81	1.16	Vinegar to which water had been added; adulterated; sale illegal.
14045	3.65	3.57	-----	-----	-----	Vinegar below standard; adulterated; sale illegal.
14039	2.80	2.64	-----	-----	-----	Vinegar, below standard; change was not complete; sale as vinegar was illegal.
12821	4.60	0.25	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
12826	4.36	1.56	0.24	-----	-----	Vinegar.
14121	4.95	1.88	-----	-----	-----	do.
14118	4.55	1.56	-----	-----	-----	do.
14116	3.30	0.09	0.02	-----	-----	Spirit vinegar, below standard; misbranded; sale illegal.
13355	3.75	0.18	-----	-----	-----	Spirit vinegar, below standard; misbranded; explanation does not excuse misbranding; sale illegal.
13030	4.84	2.26	-----	-----	-----	Vinegar.
13389	4.20	0.36	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
14041	3.30	0.28	-----	-----	-----	Compound vinegar.
14068	4.05	2.53	-----	-----	-----	Vinegar.
12882	5.62	3.10	0.38	-----	-----	do.
13323	6.05	0.56	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
14043	5.10	3.56	0.43	-----	-----	Vinegar.
13322	4.00	1.56	0.23	.64	.92	Compound vinegar, sold as vinegar; misrepresented; sale illegal.
14049	1.70	1.50	-----	-----	-----	Product sold as vinegar; below standard in acidity; sale as vinegar illegal.
12855	4.62	1.78	-----	-----	-----	Vinegar.
14061	4.40	2.14	-----	-----	-----	do.
13028	4.46	1.63	-----	-----	-----	do.
13027	4.96	1.67	-----	-----	-----	do.
12872	4.70	1.55	0.26	-----	-----	Vinegar, slightly low in apple solids.
12812	4.48	0.36	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
13328	4.40	0.44	-----	-----	-----	do.
13303	5.05	2.67	-----	-----	-----	Vinegar.

## RESULTS OF THE EXAMINATION OF VINEGAR

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13018	-----	Vinegar Compound.	Frey & Son, Baltimore, Md. ....	C. R. Pope, Wilmington. ....
12832	-----	Vinegar.	Gast, Croft & Co., Louisville, Ky. ....	W. H. Hilliard, Morehead City.
13379	Vinegar, Our Pride, Distilled.	do	do	J. D. Strader, Reidsville. ....
12853	-----	Vinegar, Distilled.	James G. Gill & Co., Norfolk, Va. ....	Jackson & Roberson, Washington.
13029	Vinegar, White House.	Vinegar	do	C. C. Shores & Co., Rockingham.
13004	-----	do	J. T. Ginn & Co., Goldsboro, N. C. ....	G. D. Andrews & Bro., Clinton.
12803	-----	do	do	B. F. Grady, Goldsboro. ....
14024	Vinegar, Guaranteed Apple Vinegar, Monarch.	Vinegar, Apple.	D. J. Gregory Vinegar Co., Richmond, Va. ....	W. S. Clark, Fayetteville. ....
14029	Vinegar, Cider, Monarch.	Vinegar	do	Spray Mercantile Co., Spray..
14040	-----	Vinegar, Apple.	do	John R. Smith, Walnut Cove.
13300	Vinegar, Pure Apple, Monarch.	Vinegar	do	J. T. Tatum & Co., Fayetteville.
13024	Vinegar, Monarch.	do	do	Russell-Gillis Co., Laurinburg.
13304	-----	do	Hall & Pearsall, Wilmington, N. C. ....	W. J. Council, Red Springs...
13301	-----	do	do	Hamilton Supply Co., Red Springs.
13391	Vinegar, Hancock's Old Fashioned Apple Vinegar.	do	Hancock Grocery Co., Winston-Salem, N. C. ....	O. H. Walker, Winston-Salem
13388	-----	do	do	Long Bros., Waughtown. ....
14059	-----	Vinegar, Apple.	do	J. H. Weisner & Co., Winston-Salem.
14012	-----	Vinegar	F. S. Hashagen, Wilmington, N. C. ....	J. H. Gurganus, Wilmington..
12876	-----	-----	-----	J. L. Hassell & Co., Wilmington.
14070	-----	Vinegar, Chemical.	-----	J. A. Hauchins, Winston-Salem.
14058	-----	Vinegar	-----	J. S. Ilege, Winston-Salem ...
13305	Vinegar, Pure Apple Cider.	do	H. J. Heinz Co., Pittsburg, Pa. ....	C. V. Williams & Co., Hamlet.
13032	-----	do	do	J. T. Pinkston, Wadesboro. ....
13006	-----	do	do	J. Walter Johnston, Warsaw. ..
13035	-----	Vinegar, Pure Apple.	do	C. N. Bruner, Monroe. ....
13041	-----	Vinegar	do	S. H. Youngblood, Charlotte.
13329	Vinegar, Cider, Goldthorn.	do	Walter H. Hildick Co., New York, N. Y. ....	O. R. Cobb, Halifax. ....
12878	Vinegar, Hirsch's Pure Apple.	do	Hirsch Bros. & Co., Louisville, Ky. ....	W. H. Ricks, Greenville. ....
14067	-----	do	Houser Bros., Winston-Salem, N. C. ....	Hampton Bros., Winston-Salem.

AND SUBSTITUTES FOR VINEGAR—*Continued.*

Laboratory Number.	Acidity, Total—Per Cent.	Solid Matter in Solution—Per Cent.	Ash—Per Cent.	Total Sugars—Per Cent.	Non-sugar Solids—Per Cent.	Remarks and Conclusions.
13018	4.34	2.16	-----	-----	-----	Dried apple vinegar.
12832	4.30	0.49	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
13379	4.20	0.34	-----	-----	-----	do.
12853	4.44	0.34	-----	-----	-----	Spirit vinegar, sold as distilled vinegar. Should be sold as spirit vinegar.
13029	4.12	1.84	-----	-----	-----	Vinegar.
13004	4.64	1.66	-----	-----	-----	do.
12803	4.34	1.93	-----	-----	-----	do.
14024	4.78	2.66	-----	-----	-----	do.
14029	4.36	2.26	-----	-----	-----	do.
14040	4.95	2.33	-----	-----	-----	do.
13300	4.70	2.58	0.37	0.63	1.95	do.
13024	5.14	2.71	-----	-----	-----	do.
13304	4.90	3.17	-----	-----	-----	do.
13301	4.65	2.85	-----	-----	-----	do.
13391	4.65	1.43	-----	-----	-----	Vinegar, slightly below standard in apple solids.
13388	3.90	0.25	-----	-----	-----	Spirit vinegar, slightly below standard; sold as vinegar; misrepresented; sale illegal.
14059	4.15	2.06	-----	-----	-----	Vinegar.
14012	4.78	2.24	-----	-----	-----	do.
12876	4.30	2.62	-----	-----	-----	do.
14070	4.25	0.29	-----	-----	-----	Spirit vinegar.
14058	4.25	0.24	-----	-----	-----	Spirit vinegar; sold as vinegar; sale illegal.
13305	4.90	1.63	0.28	0.56	1.07	Vinegar.
13032	5.04	0.30	-----	-----	-----	Spirit vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
13006	5.04	1.50	-----	-----	-----	Vinegar, slightly low in apple solids.
13035	6.20	1.78	0.44	0.58	1.20	Vinegar.
13041	5.90	2.11	-----	-----	-----	do.
13329	4.00	1.97	-----	-----	-----	do.
12878	4.44	2.10	-----	-----	-----	do.
14067	4.55	-----	-----	-----	-----	Compound vinegar, sold as vinegar; misrepresented; sale illegal.

## RESULTS OF THE EXAMINATION OF VINEGAR

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
14072		Vinegar	Houser Bros., Winston-Salem, N. C.	F. H. Farabee, Winston-Salem.
12866		do	Hubbard, Slack & Co., Norfolk, Va.	J. E. Howell, Hertford
14035		Vinegar, Grape		Hudson Grocery Co., Greensboro.
14075		Vinegar	R. M. Hughes & Co., Louisville, Ky.	R. C. Poore, Mount Airy
14021		do		R. D. Caldwell & Son, Lumberton.
14025		Vinegar, Apple	R. M. Hughes & Co., Louisville, Ky.	J. F. Powell & Son, Fayetteville.
13371	Vinegar, Distilled, Monogram, Pickling and Apple.	Vinegar	do	A. A. Kluttz, Chapel Hill.
13370		do	do	J. C. Daily, West Durham
13367	Vinegar, Distilled, Pickling and Apple, Monarch.	do	do	J. C. Thomas, Apex.
13361	do	do	do	W. S. Tally, Durham
13359	do	do	do	F. S. Ligon, East Durham
13357	do	do	do	May & Page, Durham
12804		Vinegar, White Wine.	do	W. R. Thompson, Goldsboro.
12806		Vinegar	do	Spence & Vinson, Goldsboro.
12841	Vinegar, Imitation Distilled, Colored	do	do	J. F. Clark, New Bern
13316		do	do	D. C. Braswell, Wilson
13354	Vinegar, Compound Dist. Pickling and Apple, Monogram	do	do	Byrd & Upchurch, Durham
13347		do	R. M. Hughes & Co., Middleport, N. Y.	George E. Perry, Henderson.
13038	Vinegar, Monogram	do	R. M. Hughes & Co., Louisville, Ky.	Helms & Huntley, Monroe
13034		do	do	W. N. Pinkston, Wadesboro
13033		do	do	D. E. Gatewood, Wadesboro
13036		do	do	Polk Bros., Monroe
13000	Vinegar, Monogram	do	do	W. D. James, Mount Olive
13001		Vinegar, Apple.	do	M. W. Pope, Mount Olive
13005		Vinegar	do	Aman Grocery Co., Clinton
13019		Vinegar, Monogram.	do	Thomas Grocery Co., Wilmington.
13021	Vinegar, Monogram	Vinegar	do	R. H. Strickland, Maxton
13025	do	do	do	W. D. Wright, Laurinburg
13026	do	do	do	D. C. McNeill, Laurinburg
13382		do	do	Tucker & Erwin, Greensboro.
13031	Vinegar, Monogram	do	do	E. B. Liles, Rockingham

AND SUBSTITUTES FOR VINEGAR—*Continued.*

Laboratory Number.	Acidity, Total—Per Cent.	Solid Matter in Solution—Per Cent.	Ash—Per Cent.	Total Sugars—Per Cent.	Non-sugar Solids—Per Cent.	Remarks and Conclusions.
14072	3.80	0.36	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
12866	4.26	1.70	-----	-----	-----	Vinegar.
14035	5.56	0.53	-----	-----	-----	Compound grape and spirit vinegar, sold as vinegar by retail dealer; misrepresented; sale illegal.
14075	4.05	1.48	-----	-----	-----	Compound vinegar, sold as vinegar; misrepresented; sale illegal.
14021	6.70	3.85	0.57	1.17	2.66	Vinegar.
14025	4.08	1.83	-----	-----	-----	do.
13371	4.75	1.00	-----	-----	-----	Compound vinegar, sold as vinegar; misrepresented; sale illegal.
13370	3.85	1.15	-----	-----	-----	Compound vinegar, below standard; sold as vinegar; misrepresented; sale illegal.
13367	3.90	1.32	-----	-----	-----	Compound vinegar, slightly low in acidity; sold as vinegar; misrepresented; sale illegal.
13361	4.10	1.18	-----	-----	-----	Compound vinegar, sold as vinegar; misrepresented; sale illegal.
13359	4.00	1.33	-----	-----	-----	do.
13357	4.15	1.16	-----	-----	-----	Compound vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
12804	5.46	0.27	-----	-----	-----	Spirit vinegar; sold as white wine vinegar; misrepresented; sale illegal.
12806	4.61	0.65	-----	-----	-----	Compound vinegar, sold as vinegar; misrepresented; sale illegal.
12841	4.12	0.22	-----	-----	-----	Spirit vinegar, sold as vinegar; barrel was branded "Imitation Vinegar"; misrepresented; sale illegal.
13316	3.75	1.22	-----	-----	-----	Compound vinegar, sold as vinegar; misrepresented; below standard; sale was illegal.
13354	3.90	1.37	-----	-----	-----	Compound vinegar, slightly below standard; sold as vinegar; misrepresented; sale illegal.
13347	4.00	1.61	0.32	0.68	0.93	Vinegar, water added; sold as vinegar by retail dealer; sale illegal.
13038	4.94	1.15	-----	-----	-----	Compound vinegar, sold as vinegar; misrepresented; sale illegal.
13034	3.84	0.50	-----	-----	-----	Compound vinegar.
13033	4.30	1.93	-----	-----	-----	Vinegar.
13036	4.26	2.27	-----	-----	-----	do.
13000	4.40	1.10	-----	-----	-----	Compound vinegar, sold by retail dealer as vinegar; misrepresented; sale was illegal.
13001	3.94	1.39	-----	-----	-----	Compound vinegar, sold as vinegar; misrepresented; sale illegal.
13005	3.98	1.05	-----	-----	-----	do.
13019	4.20	0.50	-----	-----	-----	Compound vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
13021	4.44	1.00	-----	-----	-----	do.
13025	4.40	1.31	-----	-----	-----	Vinegar, to which water had been added; water added to vinegar is adulteration; sale illegal.
13026	4.34	0.64	-----	-----	-----	Compound vinegar, sold by dealer as vinegar; misrepresented; sale illegal.
13382	4.15	1.07	-----	-----	-----	Compound vinegar, sold as vinegar; misrepresented; sale illegal.
13031	4.42	2.12	0.34	0.72	1.40	Vinegar.

## RESULTS OF THE EXAMINATION OF VINEGAR

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
14066	-----	Vinegar	R. M. Hughes & Co., Louisville, Ky.	Liberty Mercantile Co., Winston-Salem.
12886	-----	do.	do.	W. B. Driver, Selma
12883	-----	Vinegar, Apple	do.	Farmers Mercantile Co., Selma.
12817	Vinegar, Apple Cider.	Vinegar	do.	I. E. Braxton, LaGrange
13294	-----	do.	do.	Ashley Horne & Son, Clayton
13302	Vinegar, Pure Apple.	do.	do.	John J. Thrower & Co., Red Springs.
13377	Vinegar, Pure Apple, Hyman's Old Ky. Home.	do.	The Hyman Pickle Co., Louisville, Ky.	S. F. Watkins, Reidsville.
13045	-----	do.	-----	J. F. Jamison & Co., Charlotte.
12879	-----	Vinegar, Pure Apple.	H. M. Jenkins, Washington, N. C.	J. L. Starkey, Greenville
14048	-----	Vinegar, Compound.	-----	Jolly Bros., Elkin
12871	-----	Vinegar	-----	W. D. Jones, Edenton
13429	-----	do.	-----	Miss Edith Jones, State Normal College, Greensboro
14060	-----	do.	-----	C. A. Jones, Winston-Salem
14071	-----	Vinegar, Distilled.	-----	Kirby & Tilley, Winston-Salem.
14079	-----	Vinegar	Knadler & Lucas, Louisville, Ky.	J. N. Dellinger, Shelby
13733	Vinegar, Pure Apple.	do.	do.	J. P. Carpenter, Cliffside
13385	Vinegar, Everybody's Distilled, Colored.	Vinegar, Compound.	do.	John E. Sockwell, Greensboro
12877	-----	Vinegar, Grape.	T. G. Knotts, Suffolk, Va.	J. R. & J. G. Moye, Greenville.
12885	-----	Vinegar, Knott's	do.	W. H. Etheridge, Selma
12870	-----	Vinegar	do.	M. A. Hughes, Edenton
12867	-----	do.	do.	W. L. Blanchard & Son, Hertford.
12851	-----	do.	do.	Charles M. Little, Washington.
12880	-----	Vinegar, Compound.	do.	J. S. Smith, Greenville
13331	-----	do.	do.	W. J. Burgess, Enfield
13332	-----	Vinegar	do.	M. C. Braswell, Battleboro
13334	-----	do.	do.	W. E. Edwards & Son, Battleboro.
13338	-----	do.	do.	C. G. Evans, Weldon
13342	-----	Vinegar, Grape.	do.	McGhee-Joyner Co., Franklinton.
13344	-----	Vinegar, Compound.	do.	Pirie David, Jr., Henderson

AND SUBSTITUTES FOR VINEGAR—*Continued.*

Laboratory Number.	Acidity, Total—Per Cent.	Solid Matter in Solution—Per Cent.	Ash—Per Cent.	Total Sugars—Per Cent.	Non-sugar Solids—Per Cent.	Remarks and Conclusions.
14066	3.95	1.44	-----	-----	-----	Vinegar, reduced with water; sold as vinegar; misrepresented; sale illegal.
12886	4.16	2.10	-----	-----	-----	Vinegar.
12883	4.06	2.16	-----	-----	-----	do.
12817	4.80	1.24	0.18	-----	-----	Vinegar, water added. Sold as vinegar by retail dealer; sale illegal.
13294	4.20	1.92	-----	-----	-----	Vinegar.
13302	4.00	1.75	-----	-----	-----	do.
13377	3.85	1.91	-----	-----	-----	Vinegar, slightly below standard; sale illegal.
13045	4.08	0.25	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
12879	4.16	1.73	-----	-----	-----	Vinegar.
14048	3.85	0.35	-----	-----	-----	Spirit vinegar, below standard; sold as vinegar; misrepresented; sale illegal.
12871	4.06	0.18	-----	-----	-----	Spirit vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
13429	4.25	1.74	0.30	1.14	0.60	Vinegar.
14060	4.10	1.57	-----	-----	-----	do.
14071	4.15	0.34	-----	-----	-----	Spirit vinegar, sold as distilled vinegar; was not distilled; sale was illegal.
14079	4.15	2.46	-----	-----	-----	Vinegar.
13733	4.45	2.04	-----	-----	-----	do.
13385	4.15	0.29	-----	-----	-----	Spirit vinegar; misbranded; was not distilled; sale illegal.
12877	5.40	0.45	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as grape vinegar; misrepresented; sale illegal.
12885	4.10	0.45	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
12870	5.96	0.41	-----	-----	-----	Compound vinegar, sold as vinegar; misrepresented; sale illegal.
12867	5.38	0.79	0.07	-----	-----	Compound vinegar, sold by retail dealer as vinegar; misrepresented; sale was illegal.
12851	5.24	0.46	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
12880	5.44	0.62	-----	-----	-----	Compound spirit and grape vinegar.
13331	5.90	1.98	-----	-----	-----	do.
13332	4.70	0.39	-----	-----	-----	Spirit vinegar, containing small amount of grape vinegar; sold as vinegar; misrepresented; sale illegal.
13334	4.30	0.34	-----	-----	-----	Spirit and grape vinegar, sold as vinegar by retail dealer; misrepresented; sale illegal.
13338	5.15	0.88	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
13342	5.35	0.49	-----	-----	-----	do.
13344	5.60	0.72	-----	-----	-----	Compound spirit and grape vinegar.

## RESULTS OF THE EXAMINATION OF VINEGAR

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13345		Vinegar, Grape.	T. G. Knotts, Suffolk, Va.	Beacom Supply Co., Henderson.
13349		do	do	Taylor Bros., Oxford.
13351		do	do	L. Thomas, Oxford.
13364		do	do	R. H. Morris, Durham.
13365		Vinegar	do	Main Street Grocery Co., Durham.
13366		Vinegar, Grape.	do	D. A. Saunders, Apex.
13381		Vinegar, Compound.	do	Hutcherson Pure Food Store, Reidsville.
13383		Vinegar, Grape	do	Hiatt & Barker, Greensboro.
13384		do	do	John E. Sockwell, Greensboro.
13397		do	do	Moser Grocery Co., Winston-Salem.
13293		Vinegar	do	Y. M. Holland, Clayton.
13297	Vinegar, Knott's Grape and Distilled.	Vinegar, Grape.	do	S. C. Turnage, Smithfield.
13296		Vinegar	do	W. M. Sanders, Smithfield.
13307		do	do	Powers & Millar, Sanford.
13309		do	do	O. M. Goodwin, Sanford.
13311		Vinegar, Grape.	do	P. & R. Grocery, Southern Pines.
13318		Vinegar	do	J. H. Gill, Wilson.
13320		Vinegar, Grape.	do	Gaston G. Levy, Rocky Mount.
13321		Vinegar, Compound.	do	C. R. L. Matthews, Rocky Mount.
13326		Vinegar	do	D. C. Bell, Halifax.
13327		Vinegar, Grape.	do	W. F. Coppedge, Halifax.
12847		Vinegar, Grape Compound.	do	C. V. McGhee, New Bern.
12846	Vinegar, Compound, Distilled, Grape.	Vinegar	do	Coöperative Supply Co., New Bern.
12844	do	do	do	E. B. Hackburn, New Bern.
12842		do	do	Lucas & Lewis, New Bern.
12839		Vinegar, Grape.	do	J. L. McDaniel, New Bern.
12838		Vinegar	do	S. W. Willis, New Bern.
12816	Vinegar, Compound, Distilled, Grape.	do	do	H. A. Powell Grocery Co., Goldsboro.
12814		Vinegar, Grape.	do	W. D. Creech, Goldsboro.
12813		Vinegar	do	H. Williams, Goldsboro.

AND SUBSTITUTES FOR VINEGAR—*Continued.*

Laboratory Number.	Acidity, Total— Per Cent.	Solid Matter in Solution— Per Cent.	Ash—Per Cent.	Total Sugars— Per Cent.	Non-sugar Solids— Per Cent.	Remarks and Conclusions.
13345	5.35	0.44	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as grape vinegar; misrepresented; sale illegal.
13349	6.45	0.59	0.04	0.11	0.48	do.
13351	5.10	0.62	-----	-----	-----	do.
13364	5.90	0.57	0.05	0.10	0.47	do.
13365	5.45	0.44	0.05	0.12	0.32	Compound spirit and grape vinegar; was sold by retail dealer as vinegar; misrepresented; sale illegal.
13366	5.65	0.69	-----	-----	-----	Compound spirit and grape vinegar; was sold by retail dealer as grape vinegar; misrepresented; sale was illegal.
13381	5.50	0.53	-----	-----	-----	Compound spirit and grape vinegar.
13383	5.45	0.53	0.06	0.08	0.45	Compound spirit and grape vinegar; was sold by retail dealer as grape vinegar; misrepresented; sale illegal.
13384	5.55	0.52	-----	-----	-----	do.
13397	5.35	0.55	-----	-----	-----	do.
13293	4.85	0.35	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
13297	5.55	0.40	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as grape vinegar; misrepresented; sale illegal.
13296	5.40	0.41	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
13307	5.00	0.39	-----	-----	-----	do.
13309	5.00	0.35	-----	-----	-----	do.
13311	5.60	0.44	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as grape vinegar; misrepresented; sale illegal.
13318	5.35	0.59	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
13320	5.45	0.53	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as grape vinegar; misrepresented; sale illegal.
13321	5.65	0.64	-----	-----	-----	Compound spirit and grape vinegar.
13326	5.50	0.52	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
13327	5.15	0.34	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as grape vinegar; misrepresented; sale illegal.
12847	5.38	0.58	-----	-----	-----	Compound spirit and grape vinegar.
12846	6.22	0.56	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
12844	5.22	0.41	-----	-----	-----	do.
12842	5.46	0.43	-----	-----	-----	do.
12839	5.40	0.46	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as grape vinegar; misrepresented; sale illegal.
12838	5.20	0.46	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
12816	5.54	0.73	-----	-----	-----	do.
12814	5.78	0.82	-----	-----	-----	Compound spirit and grape vinegar, sold as grape vinegar by retail dealer; misrepresented; sale illegal.
12813	5.50	0.61	-----	-----	-----	Compound spirit and grape vinegar, sold by dealer as vinegar; misrepresented; sale was illegal.

## RESULTS OF THE EXAMINATION OF VINEGAR

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
12810		Vinegar	T. G. Knotts, Suffolk, Va.	J. G. Derr, Goldsboro.
12809		Vinegar, Grape.	do.	W. L. Summerlin Co., Goldsboro.
12808	Vinegar, Compound, Distilled, Grape.	Vinegar.	do.	C. D. Taylor & Co., Goldsboro.
12805		Vinegar, Compound.	do.	Mrs. L. B. Bass, Goldsboro.
12825		Vinegar	do.	Hardy Hill, Kinston.
14022		Vinegar, Grape.	do.	R. F. Jernigan, Dunn.
14063		do.	do.	Frank L. Reid, Winston-Salem.
13308				Lee Store Co., Sanford.
14026		Vinegar, Country.	P. D. Lemon, Reidsville.	Hazel & Mims, Reidsville.
13046				S. R. Lentz, Charlotte.
13039		Vinegar	Lexington Grocery Co., Lexington, N. C.	Smith Grocery Co., Lexington.
12852		do.		Charles M. Little, Washington.
13339		do.		Littleton Meat Market, Littleton.
14069		Vinegar, Pure Apple.		C. H. Lloyd, Winston-Salem.
12652		Vinegar		G. B. Lockhart, Durham.
13401		do.	G. C. Lovell Co., Mount Airy, N. C.	A. Valentine, Mount Airy.
14032		Vinegar, Apple.	Tom Lynch, Greensboro, N. C.	M. S. Jeffreys, Greensboro.
13398	Vinegar, Blended with Pure Apple.	Vinegar	Madison Grocery Co., Madison, N. C.	Madison Grocery Co., Madison.
12868		do.		W. A. Mansfield, Edenton.
14023		Vinegar, Apple.		S. S. Marks, Dunn.
14015		Vinegar		L. J. Mason, Wilmington.
12999		do.		L. C. McCullen, Mount Olive.
12875		do.		M. B. McGowan, Williamston.
13372		do.	McLamb Grocery Co., Burlington, N. C.	L. B. McAdams & Son, Burlington.
13399		do.		Meador Supply Co., Madison.
12819		do.		E. S. Mewborn, LaGrange.
14076		do.		W. F. Midkiff, Mount Airy.
12828		do.		F. X. Miller & Sons, Kinston.
12848		do.	E. R. Mixon & Co., Washington, N. C.	W. M. Swanner, Washington.
13306		do.	Monger-Hatch Co., Sanford, N. C.	Nisbet & Womble, Sanford.
13376		do.		C. D. Moore, Graham.
13335		do.		L. J. Moore, Weldon.
14073		do.		Moser Grocery Co., Winston-Salem.

AND SUBSTITUTES FOR VINEGAR—*Continued.*

Laboratory Number.	Acidity, Total, Per Cent.	Solid Matter in Solution—Per Cent.	Ash—Per Cent.	Total Sugars—Per Cent.	Non-sugar Solids—Per Cent.	Remarks and Conclusions.
12810	4.08	0.38	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
12809	5.40	0.50	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as grape vinegar; misrepresented; sale illegal.
12808	5.12	0.53	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
12805	5.22	0.42	-----	-----	-----	Compound spirit and grape vinegar.
12825	5.78	0.41	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
14022	5.18	0.54	-----	-----	-----	Compound spirit and grape vinegar; was sold as grape vinegar by retail dealer; misrepresented; sale illegal.
14063	5.05	0.46	-----	-----	-----	do.
13308	4.55	1.92	-----	-----	-----	Vinegar.
14026	4.50	3.29	-----	-----	-----	do.
13046	4.32	1.76	-----	-----	-----	do.
13039	4.34	1.81	-----	-----	-----	do.
12852	5.00	0.32	-----	-----	-----	Spirit vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
13339	5.00	0.38	-----	-----	-----	do.
14069	3.90	1.45	-----	-----	-----	Vinegar, to which water had been added; below standard; adulterated; sale illegal.
12652	4.38	1.46	0.40	-----	-----	Vinegar, solids low. Indication of added water and spirit vinegar.
13401	4.15	0.33	-----	-----	-----	Spirit vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
14032	6.50	1.97	-----	-----	-----	Vinegar.
13398	2.15	0.40	-----	-----	-----	Compound vinegar, sold as vinegar; misrepresented; sale illegal.
12868	5.52	0.28	-----	-----	-----	Spirit vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
14023	4.02	2.33	-----	-----	-----	Vinegar.
14015	4.82	1.80	-----	-----	-----	do.
12999	6.66	1.10	-----	-----	-----	Compound vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
12875	5.16	0.59	-----	-----	-----	Spirit vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
13372	4.40	1.97	-----	-----	-----	Vinegar.
13399	4.10	1.91	0.29	0.70	1.21	do.
12819	4.48	2.00	-----	-----	-----	do.
14076	3.30	2.67	-----	-----	-----	Vinegar, below standard; adulterated; sale illegal.
12828	4.72	2.00	-----	-----	-----	Vinegar.
12848	4.32	0.19	-----	-----	-----	Spirit vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
13306	4.65	-----	-----	-----	-----	Vinegar.
13376	5.00	0.53	-----	-----	-----	Spirit vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
13335	4.80	1.86	-----	-----	-----	Vinegar.
14073	3.80	4.56	-----	-----	-----	do.

## RESULTS OF THE EXAMINATION OF VINEGAR

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13017		Vinegar, Best Apple.	S. R. & J. C. Mott, Bouckville, N. Y.	H. T. Duls, Wilmington.....
14114		Vinegar, Pure Apple Cider.	National Fruit Products Co., Alexandria, Va.	N. C. Christopher, Murphy..
14013	Vinegar, Pure Apple Cider, Capitol.	Vinegar	do	E. L. Starkey, Wilmington...
12824	Vinegar, Pure Apple Cider, White House.	do	do	James F. Parrott & Bro., Kinston.
12827	Vinegar, Pure Apple Cider.	do	do	Burrell Stroud, Kinston.....
12843		do	do	H. C. Armstrong, New Bern..
13042	Vinegar, Pure Cider, White House.	do	do	McDaniel & Payne, Charlotte.
13396		do	Norman-Moir-Dalton Co., Winston-Salem, N. C.	Moser Cash Store, Winston-Salem.
12837	Vinegar, Pure Cider, Log Cabin.	do	Old Homestead Mfg. Co., Richmond, Va.	Hancock & Co., Beaufort....
12818		do		T. W. Pace, LaGrange.....
12811		do	J. H. Pate, Goldsboro.....	J. L. Sullivan, Goldsboro....
14082		do	G. W. Patterson, Concord, N. C.	Cook & Harris, Concord.....
13353		Vinegar, Grape.		Perry Grocery Co., Durham..
13040		Vinegar		Pickett Bros., Lexington....
12881		do		J. B. Pierce Co., Ayden.....
12874		do		Plymouth Mercantile Co., Plymouth.
14065		do		Putnam Grocery Co., Winston-Salem.
13387		do		Rolls & Pritchett, Greensboro
13343		do	P. A. Reavis & Co., Louisburg, N. C.	A. W. Perry, Louisburg.....
13298	Vinegar, Pride	Vinegar, Compound.	Richmond Vinegar Co., Richmond, Va.	R. I. Wallace, Smithfield.....
13360	Vinegar, Distilled and Apple, Perfect Blend.	Vinegar	do	J. E. Parham, East Durham..
13358	Vinegar, Distilled and Apple, King.	do	do	T. H. Alford, East Durham..
13348	Vinegar, Pride	Vinegar, Compound.	do	R. S. Montague, Oxford.....
13346	Vinegar, Gold Medal, Guaranteed Apple Juice.	Vinegar	do	Evans Bros., Henderson.....
12884	Vinegar, "Pride"	Vinegar Compound.	do	G. H. Eason & Bro., Selma...
13043		Vinegar		C. A. Ross, Charlotte.....
12823		do		W. W. Rouse, Kinston.....
12815	Pride	do	do	J. Z. Hinson, Goldsboro....
13003	Vinegar, Grape, Compound.	Vinegar, Grape, Compound.		W. H. Russell, Clinton.....
13390		Vinegar	Sampson Medicine Co., Winston-Salem, N. C.	Center Mercantile Co., Winston-Salem.

AND SUBSTITUTES FOR VINEGAR—*Continued.*

Laboratory Number.	Acidity, Total, Per Cent.	Solid Matter in Solution—Per Cent.	Ash—Per Cent.	Total Sugars—Per Cent.	Non-sugar Solids—Per Cent.	Remarks and Conclusions.
13017	4.90	2.39	-----	-----	-----	Vinegar.
14114	4.05	2.27	-----	-----	-----	do.
14013	4.50	1.73	-----	-----	-----	do.
12824	4.82	1.97	-----	-----	-----	do.
12827	4.24	1.50	0.23	-----	-----	Vinegar; solids little low for pure vinegar.
12843	4.54	1.79	0.26	-----	-----	Vinegar.
13042	4.24	1.81	-----	-----	-----	do.
13396	4.40	2.92	0.42	1.06	1.86	do.
12837	4.24	1.94	0.26	0.81	1.13	do.
12818	4.68	2.01	-----	-----	-----	do.
12811	7.00	0.42	-----	-----	-----	Spirit vinegar, sold by retail dealer as vinegar; sale was illegal.
14082	3.45	0.55	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
13353	5.75	1.45	-----	-----	-----	Vinegar, grape.
13040	4.12	1.76	-----	-----	-----	Vinegar.
12881	4.62	1.69	-----	-----	-----	do.
12874	4.20	2.29	-----	-----	-----	do.
14065	4.00	2.85	-----	-----	-----	do.
13387	4.15	1.94	-----	-----	-----	do.
13343	4.20	1.40	-----	-----	-----	Compound vinegar, sold as vinegar by retail dealer; misrepresented; sale illegal.
13298	3.70	0.56	-----	-----	-----	Spirit vinegar; adulterated, misbranded; explanation does not excuse plain misbranding; sale illegal.
13360	4.10	0.61	-----	-----	-----	Compound vinegar, sold by retail dealer as vinegar; misbranded; sale illegal.
13358	4.70	1.23	-----	-----	-----	Compound vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
13348	4.05	0.30	-----	-----	-----	Spirit vinegar, misbranded; explanation does not excuse misbranding; sale illegal.
13346	3.90	2.34	-----	-----	-----	Vinegar.
12884	3.82	0.23	-----	-----	-----	Spirit vinegar. Explanation does not excuse plain misbranding; misbranded; sale illegal.
13043	4.00	0.36	-----	-----	-----	Spirit vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
12823	4.38	2.51	-----	-----	-----	Vinegar.
12815	3.80	0.47	-----	-----	-----	Spirit vinegar, misbranded; explanation in small letters does not excuse misbranding; sale illegal.
13003	5.06	5.08	0.27	1.88	3.20	Compound vinegar.
13390	4.00	0.22	-----	-----	-----	Spirit vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.

## RESULTS OF THE EXAMINATION OF VINEGAR

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
13044		Vinegar.		L. L. Surratt, Charlotte.
13313		do.	E. A. Saunders & Sons Co., Richmond, Va.	B. Hurwitz & Bro., Carthage.
12856		do.		N. L. Sawyer & Co., Washington.
12849	Vinegar, Golden Rod, Pure Apple Cider.	do.	E. S. Shelby Vinegar Co., Richmond, Va.	James F. Tayloe, Washington
13299	Vinegar, Red Deer, Distilled, Colored	do.	do.	W. P. Surles, Dunn.
13375	do.	do.	do.	J. T. Black & Bro., Graham.
13374	do.	do.	do.	Graham Grocery Co., Graham
13373	do.	do.	do.	A. M. Hadley, Graham.
13356		do.	do.	I. A. Burnett, Durham.
13314		do.		Sinclair Bros., Carthage.
12830		do.	S. C. Sitterson, Kinston, N. C.	P. R. Borden, Kinston.
14122		do.	Sladen-Fakes Co., Asheville, N. C.	Frank Foster, Asheville.
14115	Vinegar, Apple.		Sladen-Fakes Co., Bryson City, N. C.	A. G. Deweese, Murphy.
12807	Vinegar.			W. M. Smith, Goldsboro.
13310		do.		J. L. Smith & Son, Southern Pines.
12858		do.		R. L. Smith, Belhaven.
14051		do.	Mrs. I. Smithey, North Wilkesboro, N. C.	Pearson Bros., North Wilkesboro.
14036		do.		W. T. Sockwell, Greensboro.
14217		do.		Snider-Raney Co., Salisbury.
13312		do.	Southern Distilling Co., Norfolk, Va.	Wallace Bros., Carthage.
14057		do.		T. A. Sparrow, Winston-Salem.
12835	Vinegar, "Spirit."			M. R. Springle, Beaufort.
13400	Vinegar.		Stokes Grocery Co., Walnut Cove, N. C.	J. S. Needham, Pilot Mountain.
13341	Vinegar, Old Time Brand, Pure Apple.	do.	Stokes-Grymes Grocery Co., Richmond, Va.	W. P. Edwards, Franklinton.
13363		do.		J. J. Stone, Durham.
13395		do.	Will Styers, Winston-Salem, N. C.	Liberty Mercantile Co., Winston-Salem.
14055		do.		Swaim & Johnson, Waughtown.
12831	Vinegar, Pure Apple Cider, "Gold Seal."	do.	Charles Syer & Co., Norfolk, Va.	S. T. Harrell & Son, Morehead City.
12836	Vinegar, Pure Apple, "Golden Seal."	do.	do.	Hancock & Co., Beaufort.
13380	Vinegar, Grape.		Suffolk Vinegar Works, Suffolk, Va.	Hazel & Mims, Reidsville.

AND SUBSTITUTES FOR VINEGAR—*Continued.*

Laboratory Number.	Acidity, Total—Per Cent.	Solid Matter in Solution—Per Cent.	Ash—Per Cent.	Total Sugars—Per Cent.	Non-sugar Solids—Per Cent.	Remarks and Conclusions.
13044	4.32	1.67	-----	-----	-----	Vinegar.
13313	4.25	1.59	0.27	0.57	1.02	Compound vinegar, misrepresented by retail dealer; sold as vinegar; sale illegal.
12856	4.54	2.53	0.29	-----	-----	Vinegar.
12849	4.10	1.69	-----	-----	-----	do.
13299	3.40	0.10	-----	-----	-----	Spirit vinegar below standard; sold by retail dealer as vinegar; misrepresented; sale illegal.
13375	4.00	0.16	-----	-----	-----	Spirit vinegar, not distilled vinegar; misbranded; sale illegal.
13374	4.00	0.52	-----	-----	-----	Spirit vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
13373	1.95	0.34	-----	-----	-----	Product too low in acidity for vinegar; sale illegal.
13356	4.10	0.46	-----	-----	-----	Spirit vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
13314	4.45	0.25	-----	-----	-----	Vinegar.
12830	4.52	0.17	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
14122	4.05	2.89	-----	-----	-----	Vinegar.
14115	4.80	2.75	-----	-----	-----	do.
12807	4.54	2.35	0.33	0.96	1.39	do.
13310	4.00	0.36	-----	-----	-----	Spirit vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
12858	4.20	1.95	-----	-----	-----	Vinegar.
14051	4.35	-----	0.32	-----	-----	do.
14036	4.44	0.19	-----	-----	-----	Spirit vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
14217	5.36	3.04	-----	-----	-----	Vinegar of good quality.
13312	4.15	2.59	-----	-----	-----	Vinegar.
14057	3.80	0.32	-----	-----	-----	Spirit vinegar, below standard; sold as vinegar; misrepresented; sale illegal.
12835	3.08	0.33	-----	-----	-----	Spirit vinegar, below standard; adulterated; sale illegal.
13400	3.65	0.21	-----	-----	-----	Spirit vinegar, below standard; sold as vinegar; misrepresented; sale illegal.
13341	4.50	2.23	-----	-----	-----	Vinegar.
13363	4.25	0.44	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
13395	2.55	2.71	0.38	0.51	2.20	Cider, partly changed to vinegar; sold as vinegar; sale illegal.
14055	4.20	0.29	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
12831	4.18	1.58	-----	-----	-----	Vinegar.
12836	4.16	1.86	0.30	-----	-----	do.
13380	5.00	0.50	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as grape vinegar; misrepresented; sale illegal.

## RESULTS OF THE EXAMINATION OF VINEGAR

Laboratory Number.	Material and Brand from Label.	Sold by Dealer as—	Manufacturer or Wholesaler.	Retail Dealer or Party Who Sent Sample for Analysis.
12820		Vinegar	Sumerell & McCoy, Kinston, N. C.	W. W. Tuton, Kinston
14064		do		W. R. Tesh, Winston-Salem
14074		do		W. W. Thomas, Mount Airy
13350		do	The Thomas-Howard Co., Durham, N. C.	Cannady & Alston, Oxford
13352		Vinegar, Monogram.	do	Patterson Bros., Durham
13362	Vinegar, Blended	Vinegar	do	A. W. Cain & Co., Durham
14031		do		Troxler Bros., Greensboro
14034		do		Tucker & Erwin, Greensboro
12869	Vinegar, Pure Apple	do	F. Valentine, Agent, Norfolk, Va.	A. J. Ward, Edenton
12663		Vinegar, Pear.	J. Van Lindley & Co., Pomona, N. C.	J. Van Lindley & Co., Pomona
12664		do	do	do
12662		do	do	do
14030		Vinegar		Variety Store Co., No. 1, Leaksville.
14652		do	Vaughn-Hemphill Co., North Wilkesboro.	Piedmont Feed Co., North Wilkesboro.
14054		Vinegar, Compound.		Vogler & Hege, Waughtown
13012		Vinegar	H. L. Vollers, Wilmington, N. C.	Cape Fear Cash Store, Wilmington.
14056		do		O. H. Walker, Winston-Salem
14038		Vinegar, Compound.		Walker Bargain House, Mocksville.
13392		Vinegar		O. H. Walker, Winston-Salem
14046		do		Webster & Robinson, Madison.
13394		do		White Star Co., Winston-Salem.
13333		do		E. A. Williams, Battleboro
14050		Vinegar, Apple.	J. F. Williams, Rockford, N. C.	The City Grocery Co., Elkin.
12860		Vinegar	R. C. Williams & Co., New York, N. Y.	Gideon Pendleton, Elizabeth City.
12845		do		Willis Grocery Co., New Bern.
12850		do		W. Gray Willis, Washington
13315		do	Wilson Wholesale Co., Wilson, N. C.	Otis Winborne, Wilson
12859		do	W. J. Woodley, Elizabeth City, N. C.	J. M. LeRoy, Elizabeth City
14027		do	Woods Bros. Co., Covesville, Va.	C. H. Pettigrew, Reidsville
13014		do	R. A. Wright, Wilmington, N. C.	W. D. Borneman, Wilmington.
13007		do	do	Borden Bros., Wilmington
13037		Vinegar, Country.	H. L. Yarbrough, Monroe, N. C.	Latham & Richardson, Monroe.

AND SUBSTITUTES FOR VINEGAR—*Continued.*

Laboratory Number.	Acidity, Total—Per Cent.	Solid Matter in Solution—Per Cent.	Ash—Per Cent.	Total Sugars—Per Cent.	Non-sugar Solids—Per Cent.	Remarks and Conclusions.
12820	5.60	0.19	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
14064	4.05	0.35	-----	-----	-----	Spirit vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
14074	3.95	0.44	-----	-----	-----	Vinegar, spirit, colored; sold as vinegar; misrepresented; sale illegal.
13350	4.90	1.90	-----	-----	-----	Vinegar.
13352	4.35	2.97	-----	-----	-----	do.
13362	3.90	1.45	-----	-----	-----	Compound vinegar, labeled a blend; misbranded; below standard; sale illegal.
14031	4.94	1.46	-----	-----	-----	Vinegar.
14034	5.38	1.20	-----	-----	-----	Compound vinegar, sold as vinegar; misrepresented; sale illegal.
12869	3.84	2.78	-----	-----	-----	Vinegar slightly below standard in acidity; sale illegal.
12663	4.54	6.51	0.26	-----	-----	Pear vinegar.
12664	4.28	5.09	0.27	-----	-----	do.
12662	4.20	5.88	0.25	-----	-----	do.
14080	3.96	1.83	-----	-----	-----	Vinegar, slightly below standard in acidity.
14052	4.05	0.30	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
14054	3.90	0.33	-----	-----	-----	Spirit vinegar.
13012	4.90	2.00	-----	-----	-----	Vinegar.
14056	4.15	1.94	-----	-----	-----	do.
14038	4.00	1.26	-----	-----	-----	Compound vinegar.
13392	4.55	0.30	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
14046	4.30	1.78	-----	-----	-----	Vinegar.
13394	4.55	1.92	-----	-----	-----	do.
13333	5.25	0.59	-----	-----	-----	Compound spirit and grape vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
14050	3.25	5.66	0.42	1.96	3.70	Vinegar, below standard in acidity; change to vinegar was not complete; sale illegal.
12860	4.74	1.48	0.28	-----	-----	Vinegar, solids slightly low.
12845	4.16	2.13	0.34	-----	-----	Vinegar.
12850	4.76	2.33	-----	-----	-----	do.
13315	4.00	0.68	-----	-----	-----	Compound vinegar, sold as vinegar; misrepresented; sale illegal.
12859	4.58	1.50	0.26	-----	-----	Vinegar, water added; adulterated; sale illegal.
14027	3.90	1.61	-----	-----	-----	Vinegar, slightly below standard in acidity.
13014	4.00	0.38	-----	-----	-----	Spirit vinegar, sold as vinegar; misrepresented; sale illegal.
13007	4.96	0.60	-----	-----	-----	Spirit vinegar, sold by retail dealer as vinegar; misrepresented; sale illegal.
13037	1.42	1.97	0.37	-----	-----	Product made from cider, too low in acidity for vinegar; sale was illegal.

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## LEAF TOBACCO SALES FOR OCTOBER, 1914.

Pounds sold for producers, first hand.....	57,064,300
Pounds sold for dealers.....	2,599,858
Pounds resold for warehouse.....	3,237,723
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	62,901,881









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